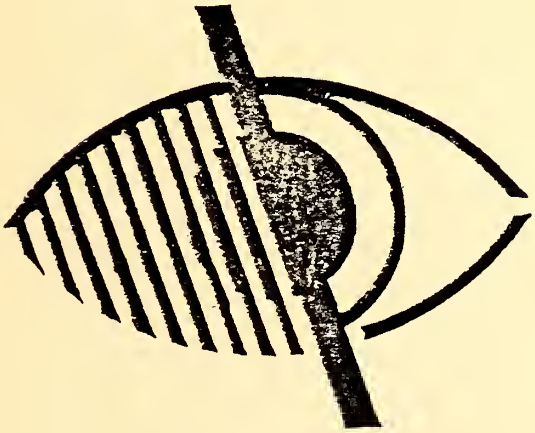
LOW VISION R&T CENTER

FINAL REPORT



PENNSYLVANIA COLLEGE OF OPTOMETRY
PHILADELPHIA, PA 19141

NIHR GRANT #G008200040
GRANT PERIOD: JANUARY 1, 1982 TO DECEMBER 31, 1982

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LOW VISION RESEARCH & TRAINING CENTER

FINAL REPORT

NIHR Grant No. G008200040

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TABLE OF CONTENTS

PAGE

PART I: OVERVIEW

- Need 1.1
- Objectives 1.8
- Research overview 1.10
- Training overview 1.12

PART II: RESEARCH PROJECTS

- Low vision data base and psychosocial factors 2.1
- Training persons with macular damage in visual skills for reading 2.18
- Visual and mobility training with fresnel prisms 2.42

PART III: TRAINING

- Surveys of training needs (regional & state) 3.1
- Regional low vision training workshop 3.3
- Other training events 3.4

PART IV: INTRA & INTERORGANIZATIONAL COOPERATION

- Intraorganizational efforts 4.1
- Interorganizational efforts 4.2

REFERENCES

APPENDICES

- Low Vision data base A
  Intake forms A1
  Optometric form A2
  Functional forms A3
  Patient information release forms A4
  WFVRC Personal Inventory A5
  Guide to using the optometric forms A6
  General data analysis A7a
  Analysis overview: Personal Inventory & intake data A7b
  Personal Inventory and intake factor analysis A7c

- Visual skills for reading
  Sample test B1
  Score sheet B2
  Training checklist B3
  Eye care specialist examination protocol B4
  Evaluation of eye tracker B5
  Visual instruction procedures B6

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- Visual & mobility training with fresnel prisms

Eye care specialist examination protocol C1
Orientation & mobility inventory C2
Orientation & mobility critical events checklist C3
Personal inventory C4
Self-analysis questionnaire (Speilberg's STAI) C5
Functional evaluation & training with fresnel prisms C6

- Training Activities

Regional training needs survey D1
Regional training needs survey-administrators D2
Summary of the regional survey D3a
Survey comparisons of agencies for the blind D3b
Survey comparisons of general rehabilitation agencies D3c
Eye care specialist survey D4
Eye care specialist survey summary D5
Regional low vision training workshop agenda--inter. D6a
Regional low vision training workshop agenda--advanced D6b
Regional low vision training workshop agenda--doctors D6c
Regional workshop objectives D7
Regional workshop staff D8
Regional workshop exhibitors D9
Regional workshop participants--intermediate tract D10a
Regional workshop participants--advanced tract D10b
Regional workshop participants--eye care specialists D10c
Follow-up letter to participants D11a
Regional workshop summary D11b
Regional workshop individualized action plans D11c
Advanced low vision seminar--Delaware agenda D12a
Advanced low vision seminar--Delaware participants D12b
Low vision presentations in 1982 D13

PART I

OVERVIEW

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PART 1: AN OVERVIEW

The Low Vision Research & Training Center, Pennsylvania College of Optometry, was established under NIHR grant #G008200040 on January 1, 1982. Its mission is to maximize the independent living and vocational rehabilitation of visually impaired individuals especially those with low vision. The Center has maintained a philosophy of interdisciplinary service delivery in combination with a comprehensive research, training, and utilization design. At all times the client (from a holistic perspective) has been the central focal point around which all activities have been conducted.

THE OVERALL NEED:

The need for low vision research & training activities is great. First, the low vision population, for far too long has been treated as either totally blind or totally sighted and since 80 to 90 percent of the 11.4 million visually impaired has low vision, they are an underserved population. Second, many of those with low vision are older or elderly. With a trend towards an older worker population nationwide, vision problems concomitant with the aging process are most important for research. Third, vision affects communication (written and verbal) and mobility, both of which are essential to independent living and successful employment. Fourth, the fact that low vision persons are frequently given rehabilitation protocols designed for the totally blind underlines a serious deficiency in the area of training. Only when substantial revisions are made in preservice and inservice training will those serving clients feel comfortable with low vision services.

In 1980, Audrey Smith at the Pennsylvania College of Optometry conducted a national needs assessment in the area of low vision. The first 100 individuals who responded included students, education and rehabilitation specialists, administrators, and faculty of colleges and universities involved in the professional preparation of individuals working with the visually impaired. The respondents who provided direct services reported that low vision individuals constituted approximately 75 percent of their caseload. In marked contrast, only 11 percent of their formal education was devoted to low vision. Feelings of frustration were consistently indicated over the lack of training in relevant situations, and the lack of co-ordination of available low vision information and services. Respondents further indicated a need for a professional with a strong clinical as well as academic background in the functional aspects of low vision, who could serve as a liaison among the several disciplines involved with low vision individuals. The respondents gave a 75 percent favorable response to the need for a graduate degree program dealing specifically with the educational/rehabilitative needs of low vision individuals.

At the 1979 national convention of the American Association of Workers for the Blind, Quillman and Goodrich, two prominent professionals in the field, addressed this dilemma. They stated: "in the future, universities' programs will have to recognize the diversity and complexity of knowledge that is necessary to provide their students with sufficient expertise to function effectively in the field of low vision. This will either require the development of new graduate programs or extensive modification of existing graduate programs" (Goodrich & Quillman, 1979-80).

The plight of the visually handicapped is truly dependent upon the training of practitioners and continued research. Many people can be helped who are now being cast aside by optometrists, by ophthalmologists, by laymen, by social workers, and by others which could help if they knew better (Hirsch, 1964). Effective training of professionals in interrelated disciplines is a necessary prerequisite to addressing rehabilitation priorities such as those enumerated in the core areas following.

CORE AREAS:

Two core areas are being addressed in low vision research activities at the Pennsylvania College of Optometry.

1. The role of psychosocial aspects of visual disabilities as these relate to independent living and vocational rehabilitation.

2. The development and evaluation of (1) diagnostic procedures, (2) treatment protocols, and (3) technological aids designed to maximize the employability and independent living status of the visually handicapped population.

These core areas were chosen as most representative of the holistic approach necessary if rehabilitation efforts are to truly meet the needs of the visually handicapped population. Core Area I recognizes the "holistic" nature of any handicap -- that it has a far reaching effect on the person which extends beyond the visible physiological disability. By examining the psychosocial variables, we sought to determine the effects on individual functioning the visual handicap can have when combined with client, family, and/or significant others' attitudes towards the disability. Core Area II takes a more traditional "task-oriented" look at variables influencing successful independent living and vocational rehabilitation outcomes. The importance of, and need for, this type of research is repeatedly cited in the field of vision rehabilitation.

Since sight is a predominant sensory modality, it plays an especially central role in the learning process and is vital to all ages and facets of daily life. For this reason a visual handicap has a major impact on the individual and frequently necessitates treatment with a focus on vocational rehabilitation and independent living, the concepts stressed in both core areas.

CORE AREA I - THE NEED

No truly global treatment of the visually handicapped population can ignore the importance of psychosocial implications to all facets of the rehabilitation process. At the core of any blind man's experience of blindness are the attitudes, beliefs, and feelings he has about the kind of person he is, what he is capable of doing, how he is supposed to feel, how he is different from others, how he is like others (Scott 1969). The following quote reflects how the field of research has neglected the importance of the psychosocial dimension in the rehabilitation of the visually handicapped.

> Psychological and social variables play an important role in understanding the cognitive and physical behaviors that result in orientation and mobility. A common sense understanding of these variables seems quite prevalent among mobility specialists, despite the fact that relatively little formal research has been done to analyze them. This lack of systematic study may reflect the

> complexity and highly individualized nature of human experiences in this area. It may also stem from a basic lack of sophistication in studying and understanding the psychosocial dimensions of our human conditions (Welsh, 1980).

Since psychosocial information on diagnosis and treatment of low vision individuals is scarce in the literature, and since individuals with this disability frequently go unnoticed, it is critical that rehabilitation and related professionals address their unique characteristics and process of adjustment. There is strong evidence in the literature (Cutsforth 1950, Welsh 1980, Wright 1980) which points to the fact that if rehabilitative efforts are to be successful, they must be directed toward the whole person. Holistic is a Gestaltist term meaning "whole," "entire," or "complete." In her discussion of the philosophic assumption of rehabilitation, Marceline Jaques (1970) also listed first the "whole person" approach in rehabilitation. As she points out, it is not possible in life to divide people into individual parts - physical, mental, psychological, social, economic. In science and professional practice, however, there are arbitrary divisions of the unitary being of the person for the convenience of collecting, classifying, and utilizing knowledge about human behavior. Thus, there are many organized professions based upon bodies of knowledge about artificially defined aspects of humanity. In rehabilitation it becomes clear that these divisions are not only simplistic interpretations but also quite inadequate in practice (Wright, 1980).

The only effective way to deal with the multifaceted needs and problems faced in the total rehabilitation approach is to employ an interdisciplinary team. This is necessary to identify and integrate the pieces of knowledge required for treating the whole person. In relationship to the low vision population in particular, Apple, et al 1980 state:

> The possibilities for successful rehabilitation of low vision persons when the appropriate interdisciplinary approach is used are clear. There is no other disability group in which such great improvements in functioning can be obtained by a majority of the population. Using prescribed techniques, the cost of rehabilitating a low vision person is usually far less than the cost of leaving

> him with his disability. Measured in terms of return of function, comprehensive low vision services are highly cost-effective.

The most basic need for research lies in the generalized area of the nature and importance of various psychosocial variables. There have been some attempts to quantify the impact of psychosocial variables. These range from the general personality tests such as Minimult, Seale and Life Events Checklist, to the Handicap Problems Inventory which is specific to the disabled and the Beliefs about Blindness Scale which focuses directly on the visually impaired (De l'Aune, W.R., Needham, W., Scheel and Lerner, E., 1974; Needham, W., De l'Aune, W. and Fry, G., 1975; Needham, W. and De l'Aune, W., 1976; Wright, G.N. and Remmers, H.H., 1960). Several of these sources were investigated and assessed (prior to this research project) as to their utility in predicting independent living and vocational success with the visually disabled. It is clear that the psychosocial aspect of vision rehabilitation is complex and currently poorly understood. This was therefore explored further in Research Project 1.

CORE AREA II - THE NEED

Research needs in the diagnostic area focus on refining and developing accurate assessment tools. One recurring problem in the assessment of visually handicapped individuals is the lack of correlation between clinical data and functional appraisals of performance. Rehabilitation professionals are continually faced with the proverbial situation in which the client responds in a manner contrary to what was expected from clinical measurements. The validity of clinical measurement tools has been disputed time after time. Scott (1969) points out that while form sense and the resolving power of the lens are the salient variables in the area of normal vision, they are only two of many salient variables in the area of severe visual impairment. Others include the state of light adaptation of the eye, fatigue, illumination, contrast, reflection, systemic and eye pathology, the transparency of the media, the degree of refractive error, the degree of diffraction, the state of accommodation and convergence of the eye, the state of muscle function, and the adequacy of the scanning movement of the eye. None of these factors is measured by the Snellen test.

Specific assessment techniques of visual function for individuals with central vision loss is particularly crucial. Training programs for reading are very dependent upon adequate measurement of exactly where the "blind spot" is. However, the common notation found on field reports in low vision clinics is "unreliable", "questionable", "poor fixation", "unable to determine exact size of scotoma". The report of the Workshop on Research Opportunities relevant to the Management of Severe Visual Impairment (National Eye Institute, 1977) states that research in this area has implications for the use of optical devices, for training, and for instruction in reading and mobility with limited visual capability. Such research is important in the use of vision in many areas of the natural environment and requires precise measurement of visual and behavior performance.

At times, specific pathologies require specific training procedures, such as eccentric viewing techniques. Although this training area has elicited some research, the few techniques designed thus far are still failing many visually handicapped people. The adventitiously blinded adult may encounter a good deal of difficulty in learning eccentric viewing (Apple & Blasch, 1975). However, it has been observed that those who do learn eccentric viewing, are better able to use their remaining vision than are those who do not. The question of assessing improvement in eccentric viewing ability is very important and should not be ignored although improvement may be expected following successful training. The degree of change to be expected has not been determined (Goodrich and Quillman, 1977).

Central and peripheral field defects both pose unique training problems. There has been a need for research to study and evaluate different strategies for training to improve the utilization of residual vision capacities of the paracentral or peripheral retina. Similarly, there is a need to study and develop methods for optimizing function in persons with constricted or hemianopic fields. Optimal scanning, peripheral awareness, and space sense skills for effective and safe mobility and orientation must be defined and suitable training methods developed for affected individuals (National Advisory Eye Council, 1981).

In the course of training in the use of optical aids it is often discovered that the proverbial "cart" had once again gone before the "horse". By this it is meant that some visually handicapped individuals are so out of touch with their visual capabilities that they must be taught basic visual skills that most fully sighted individuals have developed by six months of age. The mobility specialist embarking upon a mobility program for a low vision patient must decide at what level to begin visual training. Both visual stimulation training and optical aids training may be necessary for the individual to function at his most effective level. In many cases, visual stimulation training serves as a basis for optical aid training (Weiner & Vopata, 1980).

It is assumed that technological aids are an accepted part of the vision rehabilitation process, and new devices are being developed all the time. This very fact points to a need for guidelines for aid development, objective standards and the evaluation and categorization of existing aids. The National Advisory Eye Council's Panel Report on Low Vision and Rehabilitation (1981) devoted several pages to an inventory of "important new aids" which are considered "useful to those with visual loss". Although the report addresses how the aid is useful, it never examines the question of efficacy or applicability of the aid with particular vocational or avocational pursuits or with a specific type of visual loss. The areas of comprehensive, functional aid evaluation is relatively new and thus the literature is sparse on the subject. However, the importance of comprehensive, functional aid evaluation should not be understated. As Tanaka, Murakami and Shimizu point out the availability of new devices to enhance mobility necessitates the measurement of performance of people when using them so a definitive statement about their usefulness can be made (1981). Concurring with this, Barraga points out that a continuing evaluation and application of new optical, technical and medical-surgical techniques should be an integral part of services to adults with diminished vision (1976).

Although device evaluation is usually envisioned as a vital part of rehabilitation research, time and money constraints often force the professional to choose between rehabilitation of patients and research/evaluation of aids. Needless to say, research priorities are the ones to be put aside. In order to conduct follow-up studies or any type of research in mobility, the researcher requires time, funding, and administrative support. There are few agencies or programs in the U.S. that have O & M research positions or that provide time to do research in addition to instruction. Nevertheless, follow-up studies in mobility are essential. They provide feedback to the instructors and administrators regarding the effectiveness of the programs and aids. Such studies give essential user information which can then be shared with individuals who are interested in receiving training or are currently being trained (Morrissette, Goodrich and Hennessey, 1981).

Evaluation of aids, admittedly necessary, is no easy task. It requires an analysis of a product in a non-laboratory situation because only in realistic settings can the effectiveness and utility of methods and materials be truly ascertained. Thus, it is important to examine evaluations of products for the visually handicapped objectively to identify their strengths and weaknesses. Through this process, it will be possible to suggest guidelines for designing goals and strategies for future evaluative research (Hall, 1980).

These core areas were addressed and are reported in Part II: Research Projects.

OBJECTIVES:

The long-range objectives which have guided the research and training program during its first year are as follows:

1. Research

    a. To approach the rehabilitative process as it relates to the visually handicapped population in a systematic manner through reviewing current sources in rehabilitation, gerontology, low vision and other related literature.

    b. To ensure relevance when selecting research problems for study, by deriving such problems from service delivery needs.

    c. To establish a solid foundation for on-going research through the development and implementation of a comprehensive, flexible data base on the visually handicapped population.

    d. To extend this data base to other segments of the low vision population and to foster interinstitutional cooperation and sharing of data and computer resources.

    e. To begin research on the specific problems related to predictors of success in independent living and vocational rehabilitation based on data collected from the combined populations of the: William Feinbloom Vision Rehabilitation Center, Pennsylvania Blindness and Visual Services, twenty-four Pennsylvania state-wide institutions for Mental Health and Retardation and regional public and private agencies and schools.

f. To address the problem of inconsistent clinical results in visual examination of the low vision patient through the use of an eye tracker to analyze and measure the variability of fixation of patients who are eccentrically viewing during testing.

g. To evaluate the efficacy and applicability of technological aids and treatment protocols currently used in low vision rehabilitation.

h. To assess, using data base information, the psychosocial problems and self-image of the low vision population who cannot identify either with the normally sighted or with the blind.

i. To address the problems of visual assessment of multiply handicapped, mentally retarded children and adults, and the elderly.

2. Training

a. To identify training needs of medical, social service, educational and rehabilitation personnel working in the field of the visually handicapped.

b. To upgrade the skills of providers working with the visually handicapped through continuing education and advanced training.

c. To improve the skills of students and professionals involved in professional preparation programs in education and rehabilitation of the visually handicapped, through ongoing dissemination of research efforts and improved training materials.

d. To offer, in an understandable and usable manner, research findings and training materials to visually handicapped individuals, their families and the public.

e. To improve communication and encourage collaboration in planning, data collection, sharing information and resource development.

3. Service Delivery

   a. To increase the number and timeliness of appropriate referrals of low vision individuals through a network of local and state schools, institutions, public and private agencies, eye care specialists, and visually handicapped individuals and their families.

   b. To establish a strong referral component within the proposed Center, expanding the referral relationship between the William Feinbloom Vision Rehabilitation Center and public and private schools and agencies, optometrists and ophthalmologists who deal with the visually handicapped population.

   c. To maximize the functional ability and self-sufficiency of visually handicapped individuals through various forms of rehabilitation assessment, training protocols, and technological aids.

   d. To promote optimum use of rehabilitation personnel staff to improve access to the vocational rehabilitation system and to monitor ongoing efforts, while guarding against clients who are "lost" or "forgotten" by the system, through the use of a computerized data base management system.

   e. To establish interagency collaboration in developing priorities, and initiating and developing programs of shared information, geared toward improved service delivery to the visually handicapped population.

AN OVERVIEW OF RESEARCH PROJECTS:

To meet stated research objectives three major research efforts were planned and begun for one year (with the anticipation of expanding some or all of these with future funding). Project 1 focused on the preliminary analysis of psychosocial factors affecting low visiion rehabilitatiion and the data base development and computerization to facilitate such assessments. Project 2 explored assessment and training techniques for individuals with central field losses. Project 3 dealt with peripheral field losses and examined more closely, the use of visual field enhancement systems with training to improve mobility. The projects were completed though not totally as planned.

As a result of Project 1, a low vision computerized data base was created. It includes four new objective forms for collecting medical, vocational, psychosocial and other functional data. In addition a personal inventory of 21 questions was developed to assess key psychosocial factors on selected clients.

The development of the computerized low vision data base was a major accomplishment for several reasons. First, because it was developed by an interdisciplinary team and therefore, has transferability of its data elements to most low vision service delivery systems. Second, because it addressed psychosocial factors, one of the weakest links to comprehensive low vision research. Third, because of obstacles as follows--personnel changes, nonparticipation by one of the intake workers, the nonobjective status of present data gathering practices, the unexpected increase in patient load affecting staff time, timely accessing records from the records room, locating current records from varied offices, obtaining equipment, getting and keeping equipment functioning properly with multiple users, getting acceptance of additional data items for the intake interview, and getting acceptance of objective data collection methods. Details of the project are found in Part II and sample forms in Appendix A5.

Project 2 focused on patients with macular degeneration and their specialized training and rehabilitation needs. More specifically, the staff in this project developed and tested methods for evaluating visual skills for reading by individuals with central field loss. In addition, they developed and tested functional and clinical methods for improving these visual skills.

As a result of this project there now exists-

1. A functional assessment instrument
   a. for assessing Visual skills for reading.
   b. for evaluating different training procedures making systematic program evaluation or cost-benefit analysis possible).
2. Validation that training is necessary for some senile macular degeneration persons to optimize their visual skills in reading.
3. Evaluation of a training procedure for

improving visual skills.

4. The first eye tracker that can accurately measure eye position and thus enable rehabilitation specialist to observe the visual behavior they are trying to improve. It also permits use of biofeedback techniques for modifying gaze angle and stopping nystagmus.

The details of the need, methodology and results are found in Part II. Appendix B includes the forms used and instruments developed.

Factors which limited the scope and time spent on the research project included problems in patient selection and scheduling, delays in transfering staff time to research activities, patient, and methodological adjustments.

Project 3 assessed the use of fresnel prisms with training to enhance vision by individuals with visual field problems (such as constricted fields, tunnel vision, loss of lower, upper, and/or side vision). The study looked at the possible impact of using fresnel prisms on patients' self concept, independence, mobility, family dynamics and occupational status. Stress factors in mobility situations were also assessed. The project provides in depth objective and subjective information on subjects use of the fresnel prism and a placebo after receiving training. The instructor's journal during the contacts with the subject are supplemented with descriptions by the subjects of their experiences and feelings in the day to day use of these. For details see Part II. The instruments used in assessing mobility, stress, and psychosocial factors are provided in Appendix C.

AN OVERVIEW OF TRAINING:

Training activities were conducted for rehabilitation professionals, eye care specialists, and consumers throughout the state and region. At least 44 presentations were made reaching over 1896 individuals. Several training needs surveys of approximately 300 people were completed and used to guide training activities, especially the Regional Low Vision Training Workshop. Details of these activities are provided in Part III with forms in Appendix D.

STAFF QUALIFICATIONS:

The National Advisory Eye Council (1981) stated unequivocally: "The fact that multidisciplinary services are desirable is beyond dispute." It further emphasized that support should be given to developing a number of substantial multidisciplinary centers for clinical and rehabilitation services for the visually handicapped.

The staff of the William Feinbloom Vision Rehabilitation Center (WFVRC) (a specialty service of the college's patient care facility) and the staff of the Pennsylvania College of Optometry have been especially well qualified to conduct the research and training activities. First, the WFVRC is founded on the interdisciplinary philosophy of approaching the visually handicapped individual as a "total" person, and as one who deserves a complement of medical, optometric, educational, psychological, and rehabilitative services. Second, the members of the Feinbloom Center's interdisciplinary staff, in addition to their patient care responsibilities, have participated actively in conferences, workshops and in-service training seminars on rehabilitation of the visually impaired. Third, the staff have been involved in testing newer optical aids, especially those produced by Dr. William Feinbloom for improved vision among this underserved population.

The academic development and research staff at the Pennsylvania College of Optometry provided the depth of experience in research as well as education of rehabilitation professionals, consumers and their families concerning low vision problems and resources. In fact, the staff at PCO have recently received a grant to launch a Master's of Science Degree Program in Vision Rehabilitation which can ultimately lead to certification of professionals working with low vision clients (or patients).

PART 2

RESEARCH PROJECTS

PROJECT 1

"The development of a computerized information system to assess the impact of psychosocial factors on the potential for independent living and vocational rehabilitation of visually handicapped persons."

PRINCIPAL INVESTIGATORS:	Discipline	% Project Time
Anthony DiStefano, O.D., M.Ed., M.P.H.	Optometry	20%
William De l'Aune	Psychology	20%
MAJOR CONTRIBUTORS:		
Roger Cummings, O.D.	Optometry	10%
Amy Grossman, M.S.W.	Social Work	75%
Duane Geruschat, M.A.	Mobility	10%
Marcy Graboyes, M.S.W.	Social Work	20%
Marty Lindower, O.D.	Optometry	10%
Rebecca Hutchins, O.D. Student	Optometry	10%

FUNDING:

Project 1 received 20% of the overall budget. This included 16% from NIHR and 4% from PCO. The federal grant totaled $342.924 and the college contributed $43,681.

ABSTRACT:

A comprehensive, computerized low vision data base was developed, refined and implemented on 471 patients in a low vision interdisciplinary setting. A small subset of this population was administered a psychosocial inventory which was then analyzed for preliminary information. The results are only suggestive of the possible relationships between the factors in the psychosocial inventory and the demographic, clinical and functional data items. A factor analysis was also made within the 21 question inventory. One of the objectives of the project included establishing a computer linkage with another low vision service delivery setting as a beginning for development of a network of similarly linked low vision programs.

KEYWORDS:

data base, psychosocial, independent living, vocational rehabilitation, visually handicapped, low vision, partially sighted

PROJECT #1:
DEVELOPMENT OF COMPUTERIZED INFORMATION SYSTEM

I. PURPOSE:

To develop a comprehensive computerized database to assess the impact of psychosocial factors on the potential for independent living and vocational rehabilitation of visually handicapped persons.

II. OBJECTIVES:

1. To identify and evaluate existing information systems and databases utilized in the blindness and low vision field.

2. To develop an evolving computerized information system and database of demographic, clinical, psychological and social characteristics of blind or visually handicapped individuals to facilitate descriptive, predictive, and evaluative studies of the rehabilitation process.

3. To establish a computer linkage with the Eastern Blind Rehabilitation Center (EBRC) as a model for the future development of a network of similarly linked institutions/agencies.

4. To develop a user manual to facilitate participation of institutions/agencies in the database information system network.

5. To conduct preliminary exploratory data analysis on the relationship between psychosocial factors and both the potential for independent living and the vocational rehabilitation status of the visually handicapped.

III. HYPOTHESIS:

A comprehensive computerized database, including a relevant psychosocial inventory will yield valid and reliable data which can be analyzed to assess the potential for independent living and vocational rehabilitation in visually handicapped persons.

IV. NEED:

The current state-of-the-art treatment of the visually handicapped, while paying lip service to the importance of psychosocial variables, rarely includes a systematic collection or analysis of how these factors impact a client's success or failure in the rehabilitative process.

In addition, there is a recognized need for an organized body of knowledge concerning the success and failures of different approaches to any type of rehabilitation. Focusing on visual rehabilitation, current sources of statistics are limited to either major governmental surveys of tremendous sample size but little depth, or research studies which go into great depth but suffer from limited sampling breadth. Neither of these databases has the qualities necessary to allow for the detailed evaluation of the ways in which psychosocial variables affect both visual and vocational rehabilitation.

V. TARGET GROUP:

The database information has been collected on clients at the William Feinbloom Vision Rehabilitation Center as a pilot study. Numerous interested local agencies such as the Elwyn Institute, the Nevil Institute for Rehabilitation and the Pennsylvania Deaf Blind Center were queried as to the relevancy of the major data items. Their feedback was used to modify several items, making them more generalizable to other visually handicapped populations. We can therefore assume that the instrument, with minor modifications, will be appropriate and flexible enough to act as a model for use at other institutions and agenices which participate in vision rehabilitation.

VI. METHODOLOGY:

A. Sampling

During the project period, January 1, 1982 through December 31, 1982, data were collected on 471 clients seen at WFVRC. This represents approximately 50% of the yearly patient load. Since the survey instruments were not in final form until well into the grant period, 75% of this sample consists of data collected through a retrospective record review. The other 25% of the sample was collected on a prospective basis. (This prospective survey is still ongoing.)

Complete database information is not available on all participants since all data collection forms were not finalized at the same time. The basic sequence of intake and optometric data is fairly standard, but detailed functional data has been gathered only on a small percentage of the clients since this form was the last to be developed and this information is dependent upon a client's stated objectives and therefore not relevant in all cases.

This subset of the WFVRC clientele cannot be considered a truly representative sample since the preponderance of the database consists of four-day, not local clients. In actuality, the clinic sees about 3 local patients for every four-day patient. A "four-day patient" is one who travels to the Center from out of town and has a comprehensive exam, low vision aid prescription if appropriate, and training with this aid, all between Monday and Thursday of one week. For this reason, these records are completed quickly and the information is available for entry into the database. The local patients, however, may return for several visits spaced over a six to eight month period and the records remain incomplete over a longer time. The particular biases which this fact introduces into the database can only be estimated. For example, WFVRC staff point out that four-day patients tend to be more educated, wealthier, have had their handicap for a longer time period, and have already exhausted other avenues of rehabilitation.

A pilot sample of 61 local patients were administered a 21 question psychosocial inventory. (See complete discussion under B4a).

B. Data Collection Methods

1. Data Collector Training--All persons coding or keypunching data were optometric students who underwent careful on-the-job training. Their first few forms were spot checked by the data coordinator and any questionable answers were rechecked with the appropriate WFVRC staff person. An instruction guide and coding sheets were developed to be used with the forms, and this guide was upgraded in response to coder/staff feedback. Every three months new interns rotate through the WFVRC and an hour is set aside during the first week for introduction to the forms and to answer any questions on the intended meaning and use of each entry.

2. Respondent Cooperation--There were no difficulties in obtaining client cooperation.

3. Consent Forms--Copies of the standard WFVRC consent forms can be seen in Appendix A4.

4. Instrumentation--(for copies of all instruments, see Appendix A).

a. Psychosocial Inventory--A total of 21 questions were developed which the staff felt to have "face validity" in measuring attitudes which are important to successful rehabilitation. Various survey instruments were reviewed and questions were adapted from these existing instruments whenever possible. One of the major sub-projects was the acquisition of data on this instrument to obtain factor information and measures of reliability and validity for future refinement of the inventory.

b. Intake Form--This form was designed by the social workers who conduct the intake interviews for research and clinical purposes. It includes questions about client demography, medical history, and specific goals and objectives. Answers to the Psychosocial Inventory are recorded at the end of the form. The Intake Form was assessed by all staff members and revised on several occasions to conform to the social worker's preferred interviewing style and to improve ease of recording.

c. Optometric Form--This contains pertinent medical history and current clinical data and was compiled by the three staff optometrists of the WFVRC. The digit allowances were carefully designed to accommodate the extremes of visual acuities, refractive corrections and visual fields which are found in low vision clients. The form is specific and detailed enough to provide the clinician and researcher with comprehensive, valid information on the current status and potential visual functioning of each client.

d. Functional Form-- This is really a combination of two forms, one for near and one for distance training. These forms assess the client's current visual abilities. In addition, they document training procedures designed to improve the client's visual functioning, mobility and adjustment to optical aids. A subproject related to the development of the Functional Form was the establishment of "inter-rater reliability" to ensure that data collected on the form is as objective and reproducible as possible.

5. Follow-up Survey--A non-computerized follow-up survey is currently in use at the WFVRC. Because it has a free-form content, it does not lend itself to efficient computerization and various alternatives are currently being considered for integrating this information into the current database. The most promising avenue seems to be collapsing like situations and responses into general categories and creating a "content analysis" survey which will evolve during the first several months of use into its most efficient, understandable, and usable form.

6. Converting Refusals--To date there have been no refusals; some clients have declined to answer a few items in the Psychosocial Inventory, but this has been rare. In isolated cases, the social worker has used her own judgment and decided not to administer the Inventory to a particular patient.

7. Coding and Keypunching--Since the final version of the forms were not available at the beginning of the grant period, some of the information was transferred from the patient file to the questionnaires on a retrospective basis by trained optometric students. As soon as the forms were finalized, they were incorporated into the routine examination and administered by the staff and interns who filled them out on a prospective basis.

Both the retrospective and prospective forms, once coded, were then entered into the computer by a "puncher" who, in addition to typing the data into the computer, was trained to perform mental consistency checks on the information.

The software to computerize these forms was designed by Dr. William De l'Aune following the format used by the Eastern Blind Rehabilitation Center. The software consists of an interactive program which prompts the user for data entry on each question. It allows for easy correction of data and has the ability to skip over unused portions of the form. In addition, as it is entered into the program, the data is subjected to a general edit which checks for out-of-range codes and minimizes the possibility of storing data which has been erroneously coded or punched. Computerized data is stored under a sequentially assigned number onto a standard floppy disk.

Initially, data for each form was stored on separate disks. When a disk was full, the data was transferred to a high density disk. Once all hard copy forms were completed, with their respective computer programs, a composite program containing all 3 forms was produced. In this way, all information on a client could be entered on one disk, making turnaround time on patient records much more efficient.

8. Confidentiality--Patient confidentiality is insured throughout the data collection, coding, keypunching and data analysis process. This is accomplished through the security of the records in their traditional use at WFVRC, the fact that the disks and programs are kept in locked rooms during the keypunching process, and the use of code numbers to retrieve client information. There is always limited access to the computer and the storage of the final client information for data analysis is restricted to a high density disk cartridge which is currently accessed only by Dr. William De l'Aune.

VII. RESULTS/DISCUSSION

OBJECTIVE 1:

The literature search contained in the grant proposal outlines and evaluates the existing information systems and databases utilized in the fields of blindness and low vision. No other appropriate systems were found during the research period. Contacts were made with several service delivery systems to explore the possibility of developing a common database collection system in the future. The original grant proposal also states the rationale behind the development and construction of the present system utilizing the Apple II microcomputer and applications software for initial storage and processing.

OBJECTIVE 2:

The planning, development and construction of questionnaires and the translation of these into software creating a machine-readable database represent the most necessary and time-consuming result of Project #1. It is difficult to document the amount of thought, energy, effort and compromise which contributed to the final version of each questionnaire.

Because the continuing use of data gathering instruments would ultimately depend on staff at WFVRC, it was deemed imperative by research and training center staff that the development of such forms be an interdisciplinary team effort. This was a stressful, time-consuming task which continually challenged staff to interact, prioritize the number and diversity of data elements, as well as to persuasively justify their presence in the database. The decision was made to begin collecting the most comprehensive set of data requested by the staff, noting that at the end of this first year each form would be evaluated for the elimination of unused information. (The preliminary data analysis will serve a major role in this decision-making process.)

The requisite questions, in their predefined sequence, were passed from the staff to the computer personnel who organized them into an efficient format on the computer's word processor. This first draft was then passed back to the appropriate staff persons for review and corrections. After the questionnaire was accepted and all necessary corrections made, the form was duplicated and incorporated into the Feinbloom Center's patient care record. From that time forward, the questionnaires have been used to assess all patients at WFVRC. The information is entered on the form by interns and staff, reviewed by the data entry personnel, and passed through the computer editing procedure before data analysis is begun.

In addition, retrospective studies of patients who came to the WFVRC after January 1, 1982, but before the form(s) were incorporated into the patient record were carried out by trained optometric students, as outlined in the Methodology section.

Inter-rater Reliability Subproject

As part of the development of the Functional Form, this subproject attempted to establish the objectivity of the data to be collected on near and distance use of optical aids. In rehabilitation, one of the major difficulties of doing quality research and consequently, one of the most controversial issues in the field, is concerned with the way to measure performance. This issue has two components: what to measure and the reliability of comparing such measures as taken by different observers.

Examples of approaches to the first question in the mobility situation include measurement of time, number of unwanted contacts with the environment (bumping into things) and/or number of times falling off the curb. While these variables undoubtedly contribute to the overall abilities of being mobile, the field has not concluded that this truly reflects the mobility skills of the blind or partially sighted.

A measure of reading speed or comprehension is usually chosen as a way to measure reading ability. However, when someone is using an optical aid, these common approaches to measuring performance are typically inadequate. Many clients have an array of problems which are not described solely by measuring reading performance or number of contacts with the environment. In low vision mobility and reading, the second issue arises since what one instructor values as indicating good or poor travel or reading ability with an aid may not be the same as another instructor.

Both of these issues were considered and incorporated into the final approach utilized for measuring functional performance with an optical aid (exemplified in the Functional Form). Through discussion with the instructional staff, primary criteria for subjective opinions about a client's abilities were defined as a direct result of observing performance on four specific skills. The observed criteria indicating acquisition or need for remediation of a skill were then listed, along with the most common remedial approaches to solving these problems. From these components, the functional checklist of observable patient and instructor behaviors was generated.

During the course of development an optometric student was provided with an overview of the purpose of the form, specific examples of each patient and instructor behavior, and an opportunity to use the form as an observer and to discuss any impressions of the form following the lesson.

Once the student was comfortable with the form, she completed it as an independent observer of instruction in the use of near vision aids. Concurrently, the instructor completed the same form. Both forms were then analyzed by chi square to determine significance. Results from 10 lessons revealed a chi square value of 4.95 which has a critical value of 3.8 at the .05 level of significance. This indicates that both observer's results are significantly correlated.

OBJECTIVE 3:

This objective has not yet been addressed since we have just recently finished the data gathering procedures. The EBRC is about to start collecting a major subset of the R&D Center Intake and Optometric database information. The data format is being designed to facilitate interchange of information, should cooperative research be desired. The linkage will be explored further when the EBRC database has evolved to a stage where relevant interchange is possible.

OBJECTIVE 4:

A User Guide has been written for the Optometric Questionnaire only. It is reproduced in Appendix A1. The Intake Form is self-explanatory and the Functional Forms are specific to the WFVRC protocol and not easily generalizable.

OBJECTIVE 5:

PRELIMINARY DATABASE ANALYSIS

Demographic Information

Preliminary analysis of the database indicates that the majority (61%) of the clients surveyed are male (based on a 98% response rate--hereafter referred to as rr:--). In addition, approximately two-thirds (66%) are over the age of 50 (rr: 95%). It appears that most (83%) of the clients are Caucasian, but this is based on a lower response rate of 68%. As might be expected from the age and sex of the respondents, most are currently married (56%) or widowed (26%); 18% have never been married with 3% divorced and 2% separated (rr: 96%). In summary, the prototype client in this sample is an older, married white male.

Visual Information

Baseline information on the current visual status of these clients indicates that a little over half (54%) experienced a slow onset of visual loss; approximately one-quarter (24%) have congenital problems, and the remaining 21% suffered a rapid loss of vision (rr: 88%).

As might be expected, the majority of these clients, 85%, consider themselves partially sighted; 8% continue to feel they are sighted while 5% would refer to themselves as blind (rr: 45%). Almost equal numbers of clients do, 47% and do not, 52%, experience daily fluctuations of vision (rr: 77%).

Analysis of the time since first vision loss indicates that 65% of them clients have had their visual problems for over 5 years, 11% for 3 to 5 years, 16% for 1-3 years, 4% for 6 months to 1 year and only 2% for less than 6 months (rr: 90%).

Responses to some of the questions indicate that patient education constitutes an important part of the visit to the clinic. When asked about their visual prognoses, and given a choice of eventual total blindness, continued losses, stability, vision returning or does not known, almost one-half of those who answered the question, i.e. 49% of the total, stated that they did not know (rr: 57%). Considering the many studies quoted in the grant proposal literature review citing the fear associated with visual loss, this uncertainty must be viewed as a destructive force in the life of the patient.

Visual Diagnoses

In recording diagnoses, up to 4 ICD-9 codes were recorded per patient. Therefore, although there are 233 cases represented in the data, 368 diagnosis codes are included in the data. The largest category (116) is that of degeneration of the macula and posterior pole, about 85% being senile macular degeneration or SMD. There are 40 cases of senile cataract and 30 cases of aphakia or other lens disorders, making age-related lens changes the second most common diagnosis. Twenty-two cases were diagnosed as glaucoma, 18 optic atrophy, 16 diabetic retinopathy, and 15 each of albinism and hereditary retinal dystrophies, notably retinitis pigmentosa. There are 11 cases of nystagmus, 7 choroidal degenerations, 6 vitreous disorders and all other diagnosis had 3 cases or less.

Educational Background

Clients in this sample are, on the whole, fairly well educated with 37% holding a high school diploma, 20% with some college background, 18% with a 4 year college degree, 13% with a graduate degree and 8% who have completed vocational or technical school (rr: 52%).

Two-thirds of clients completed school with no special services, 29% attended schools with special vision services and 3% went to schools for the blind. Considering the age and prevalence of SMD in this population, the high percentage of clients who had no special services probably represents those who completed school prior to a visual loss. In keeping with this, 75% read standard print in school, 17% used large print, 4% tape recorders, and only 2% (3 people) read Braille (rr: 25%).

Living, Employment And Financial Situation

Forty-two percent of clients live with a spouse, 22% live alone; 14% live with parents and 7% live with a child. Less than 5% each live with friends, in an institution, with other relatives or in another type of living situation (rr: 63%).

As expected, close to half of clients surveyed (46%) are retired. Only 18% are working full-time; 13% are unemployed, 8% are students; 7% work part-time and 6% are homemakers (rr: 86%). However, responses to the question of major occupation indicate that almost one third (30%) hold or have held managerial or professional jobs. Twenty-three percent each have held technical/skilled trade and semi-skilled/clerical jobs, with 13% working unskilled jobs and 8% who have never been employed (rr: 85%).

It is interesting to note that over one-half (59%) admitted that they had experienced vocational problems due to their visual impairment. Although the response rate to this question may seem low (rr: 28%), the number of respondents (132) is slightly above the number of clients who are currently working (105) at the time the question was asked, which makes sense.

Forty-two percent of the clients have Social Security as their primary source of financial support. Other sources of support are about equally divided between family/friends (18%), own earnings and other, both 14%, and dividends-savings-rent, 8% (rr: 30%).

Client Goals

With a low response rate of 29%, the primary daily living concerns were grooming (26%) and cooking (22%), with money management next at 14% followed by shopping (11%), eating (8%), phoning and sewing, (both 7%), and cleaning at 3%.

Most respondents had reading as their major personal goal (76%); all other categories had less than 5% (rr: 97%).

Mobility concerns had crossing streets heading the list (42%), followed by going down steps (25%), reading signs (22%) and light sensitivity 6%. Other categories of crowd comfort, sighted guide and public transportation had 1% (3 individuals) each (rr: 56%).

PERSONAL INVENTORY CORRELATES

A random sample (61) of the patients were administered a 21 question psychosocial inventory (see Appendix A7). Each question was answered with one of the following responses: 1-Strongly agree, 2-Agree, 3-Neutral, 4-Disagree, 5-Strongly disagree

Responses were then scored on a scale ranging from 1, representing a negative attitude, 3 being neutral to 5, corresponding to a positive outlook. If an individual answered each of the questions in the most positive way possible, his or her total score would be 5 x 21 or 105. Unanswered items were assigned the neutral score of 3. The lowest total score is 21 so every client's psychosocial score must lie between 21 and 105. These totals are used as correlates in the following manner: each person's overall score was summed and averaged with others who gave the same response to a question. In this way an average personality profile for each response category is generated. For example, the overall scores for all males are summed, then divided by the number of male respondents and the resulting mean for males in the study was 75.10 as opposed to 73.67 for all females.

Psychosocial correlates for some questions indicated no major difference between the groups or contained samples too small to be statistically relevant and are therefore not discussed in this section. A comprehensive list of all psychosocial inventory data can be found in Appendix A7.

When reading the psychosocial data results, it is important to keep in mind the limited sample size and the pilot nature of the psychosocial questions. These numbers and percentages therefore are only suggestive of the possible relationships between these variables and the demographic, social, clinical and functional data items. However, it is important to note that a preliminary presentation of the data to staff members generated renewed interest in reassessing the psychosocial inventory and, indeed the entire database since it reinforced the exploratory data capabilities of the system. Since that time, the project has experienced a second major wave of review and comment.

Demographic Psychosocial Correlates

It is difficult to generalize from the data on race since only 6 clients in the sample were non-white, however the 54 Caucasian respondents do show a higher average score of 74.8 compared to the 69.8 of the 5 blacks. The remaining Hispanic client's score is one of the highest overall scores to be found, 79.

Psychosocial correlates related to marital status show married clients having the highest score of 76.4, followed by those who have never been married at 74.9, with those who are widowed scoring a low of 70.7.

Younger patients seem to enjoy a more positive outlook as the psychosocial correlates decrease with increasing age of the client: the 5 who are under 21 years old have a mean of 76.4; the 26 between 21 and 70 scored 74.9, the 23 between 70 and 82 have an average of 74.3, and the 7 who are over the age of 83 scored the low of 71.3.

Visual Information Psychosocial Correlates

Psychosocial correlates related to a client's visual self-perception does seem to support the adage that it is worse to be "neither fish nor fowl" since the one "blind" individual has the highest score of 79, those 11 clients who feel they are sighted have a mean of 75.45, and the 39 partially sighted score the low of 72.69.

In addition, the idea that the passage of time improves one's outlook is also borne out by the psychosocial indices related to time since first vision loss: the longer the time span since the vision loss, the higher is the mean psychosocial score:

Less than six months	68.5
Six months to one year	71.0
One to three years	72.9
Three to five year	74.4
More than five years	75.8

The importance of patient education is further underlined by the psychosocial indices related to visual prognosis. Clients who did not know their visual prognosis have the lowest mean score of all the categories. Naturally, those who expected their vision to return topped the list with a mean of 84.5 (2 people); those expecting eventual total blindness had a score of 75.67 (3 people); those with stable visual losses scored 74.29 (17 people); those expecting continued losses (14 people) had a score of 71.57; and finally, those who did not know their prognosis (23 people) had the low score of 71.35. Note that their mean score is even lower than those who expect continued losses. This fact is even more startling when coupled with the previously mentioned statistic that 65% of the WFVRC clients have had their visual problem, and thus probably a diagnosis, for over 5 years! Considering the impact of psychosocial variables on life, an understanding of one's visual problem, its functional implications, prognosis and the mere act of talking about the handicap may be worth the price of consultation at a low vision center.

Educational Background Psychosocial Correlates

Higher education seems to be associated with a more positive outlook as all of those (a total of 15) with some college, a 4-year degree, or a graduate degree scored a mean of 77 or over. The 10 with high school diplomas had an average of 75.2, and the 3 individuals who had attended vocational or technical school scored the relative low of 70.0.

Living, Employment and Financial Situation Psychosocial Correlates

The psychosocial scores categorized by whether vision loss had caused a change in the client's living situation indicate that those who had not made a change scored the high of 73.4 compared with others who were forced to make changes who have a mean of 69, implying that these adjustments may be reflected in their lower profile score.

Those living off their own earnings have the highest mean of 79.1, followed by family friends at 75, dividends-rent at 74, social security at 72, and dropping to a low of 66.4 for those with "other" forms of support.

Employment status psychosocial indicators bear out the fact that full-time employment is related to a more positive outlook: those 12 clients had the high mean of 81.3. The next highest group were the 28 retired persons with a score of 74.1, followed by the 11 unemployed with a 73.5, then the 3 part-time workers with a 71.3, two students whose mean was 69.0, and the lone homemaker lends truth to feminist claims by scoring the low of 57.

A preliminary factor analysis was performed on the psychosocial data to help in the refinement of the survey instrument. Appendix A7 contains full listings of the psychosocial correlations and factors with their respective loadings.

VIII. CONCLUSIONS AND RECOMMENDATIONS

This project aimed at developing a pilot database system with the flexibility of having applicability to other low vision service delivery systems. This was accomplished. And while the database is not sufficiently large to warrant realistic statistical analysis, it has established a viable system which promises to yield a wealth of valid and reliable data upon which can be constructed additional exploratory and analytical studies. The analyses presented in the preceding section must be understood within this context; they represent the type of information which is possible from this type of system when a sufficient sample has been entered.

The next step in the process of improving this database consists of refining the data forms. This process is currently underway and will be translated into revised computer software and data records. All efforts to maintain compatibility with the orginal data will be made so that no data will be lost. If extensive changes are necessary, existing data will be reformatted to fit the new framework. These planned modifications will streamline the forms and the computerization process and are seen as having potential for significant improvement of the database.

The psychosocial inventory will be cut by 25-50% of the items, eliminating ambiguous questions or those which, from the preliminary statistical analysis, prove to have little predictor value.

A post-test form, using a pertinent subset of the inital data items will be constructed, tested, and instituted during follow-up contact. The intent of this form is to measure change possibly generated by the agency intervention and thus cycle relevant information back into the service delivery system.

In summary, the revised database will be cleaner, with the elimination of overlapping or unused information, and more user compatible, with the addition of items which were recognized as missing from the pilot database system. It is hoped that future research, using this rich base of knowledge will be able to provide clinicians with practical instruments with which to measure the outcome of visual rehabilitation.

IX. RESEARCH UTILIZATION PLANS

Presentations have been made during the year on the goals and methodology of Project #1. Forms developed to date as well as preliminary analysis were presented at the AAWB National Conference in July 1982 as well as at numerous local and state programs. See Appendix D for details.

The construction of the database was done with input from other agencies and with experience gained from previous information systems. For these reasons, we believe that our experience will be generalizable to other low vision settings and may be utilized to generate a nationwide clinical database. This goal is foreseeable considering the enthusiastic response to the presentations of preliminary data analysis at national meetings during the grant period. In fact, the Eastern Blind Rehabilitation Center, prototype for the initial form, is beginning to collect a major subset of the R&D Center intake and optometric information.

The current forms have been shared with several local agencies and institutions serving the visually impaired, including Elwyn Institute, Nevil Institute for Rehabilitation, and the Pennsylvania Deaf-Blind Center. Efforts to establish a cooperative database will be explored in the near future.

The R&T Center final report will be distributed, in complete or abbreviated form, to all interested parties, notably other R&T Centers, rehabilitation agencies, Regional Rehabilitation Continuing Education programs, and advisory committees.

The R&T Center staff anticipates the prepartion of a series of articles outlining the preliminary database preparation, initial analysis and evaluation, conclusions, implications for the field and future research possibilities.

PROJECT #2

The development and evaluation of functional assessment instruments and functional and clinical methods for improving visual skills for reading by patients with macular degeneration.

PRINCIPAL INVESTIGATORS:	Discipline	% of Time
Steve Whittaker, Ph.D.	Experimental Psychology	50%
Gale Watson, M.A.Ed.	Education	30%
MAJOR CONTRIBUTORS:		
Mark Steciw, M.Ed.	Education	20%
Roger Cummings, O.D.	Optometry	10%
Adele Millhimes, O.D.	Optometry	5%

FUNDING:

Project 2 received 28% of the overall budget. This included 22.4% from NIHR and 5.6% from PCO. The federal grant totaled $342,924. The college contributed $43,681.

ABSTRACT:

Project 2 focused on patients with macular degeneration and their specialized training and rehabilitation needs. More specifically, the staff in this project developed and tested methods for evaluating visual skills for reading by individuals with central field loss. In addition, they developed and tested functional and clinical methods for improving these visual skills. Results of this project include:

1. a functional assessment instrument of visual skills for reading as well as for evaluating different training procedures
2. validation that training is necessary for senile macular degeneration persons to optimize their visual skills in reading
3. evaluation of a training procedure for improving visual skills
4. the first eye tracker that can accurately measure eye position and thus enable rehabilitation specialist to observe the visual behavior they are trying to improve. It also permits use of biofeedback techniques for modifying gaze angle and stopping nystagmus

KEYWORDS:

eccentric viewing, senile macular degeneration, reading, eye movements, low vision, visually impaired/handicapped, biofeedback, functional assessments, near tasks

Project #2: Development of Methods to Evaluate and Rehabilitate Visual Skills for Reading of Patients with Central Field Loss

I. Purpose

To develop and test methods for evaluating visual skills for reading in low vision patients with macular (central) loss in their visual fields. To develop and test functional and clinical methods for improving visual skills for reading in these patients.

II. Objectives:

1. To develop a low cost procedure for evaluating within 10 minutes visual skills for reading recognition (rather than comprehension) in low vision patients.

2. To develop and evaluate a low cost (requiring minimal instrumentation) procedure for teaching patients with central loss visual skills necessary for reading.

3. To develop an instrument for measuring horizontal and vertical eye position within 10 minutes of arc in patient with central loss who are unable to maintain steady gaze.

4. To develop a biofeedback technique using eye movement instrumentation to teach patients with central visual loss an eye position that utilizes the best retinal acuity.

III. HYPOTHESES:

OBJECTIVE 1:

H: A visual skills for reading test, based on letter and word recognition, can be administered within 10 minutes and has a test-retest reliability across forms of better than .90.

OBJECTIVE 2:

H: Near optical aids that restore acuity to enable a patient to see 1M (small) print are not sufficient to rehabiliate reading skills.

H: A visual skills training technique that emphasizes patient awareness of scotomas, consistent eccentric viewing and practice with word recognition exercises does result in an increase in 1) reading speed, 2) percentage of words correctly identified, and 3) decrease in lines missed on the visual skills for reading test.

OBJECTIVE 3:

H: An eye position monitor can be constructed that will resolve horizontal and vertical eye position within 10 minutes of arc over a 40 degree range.

OBJECTIVE 4:

Q: What is the variability of eye position that optimizes visual acuity of a patient with macular field loss?

H: An auditory biofeedback system can be used to enable a subject to position his/her eyes in an optimal position with optimal variability for character and word recognition.

IV. Need:

In 1971, it was conservatively estimated that a million people in the U.S. could no longer read ordinary newsprint, due to loss of vision, indicating visual acuities less than 20/50 (Operational Research Development, 1980). Half of these people are legally blind (VA's less than 20/200 or less than 20 degree fields, in the better eye (Goldstein, 1980), yet all have substantial remaining vision, sufficient to benefit from a variety of low vision aids and therapeutic techniques (e.g. Bachman & Inde, 1979; Faye, 1976; Mehr & Fried, 1975). Patients experiencing macular (central) loss in their visual fields, one of the two leading causes of legal blindness (Goldstein, 1980; Ederer, 1978) can only be expected to become more prevalent as the population increases in mean age (Lowman & Kirchner, 1979) since macular degeneration is an age-related disease.

The macula is that central region of the retina accounting for fine visual acuity. Damage to the macula contributes to the loss of acuity and visual skills used in reading by patients exhibiting this pathology. Loss of acuity for reading can be compensated by increasing the print size. This can be accomplished either by the use of magnifying lenses or by the use of large print materials or displays.

Consideration must also be given to visual skills used in reading (e.g. localization, steady fixation and accurate scanning). Prior to adventitious macular damage, patients developed visual skills used in reading by utilizing the fine vision afforded by the macula, particularly the fovea. Reading involved looking "directly at" individual words. A saccade would position the image of a word in the center of the macula so that its detail could be resolved. These same, well learned, eye movements in the patient with macular damage will result in the word a patient desires to read disappearing from view. Magnification and/or increases in target size compensate for loss of acuity , but unless patients are able to consistently interpret visual symbols using undamaged retinal areas, reading is still affected. Patients who have not learned new techniques of localizing, fixating and scanning print will experience frustration when attempting to read using the now-damaged macular area. Indeed, basic research on normally sighted individuals and the reports of low vision practitioners suggest that some effects of macular loss including poor gaze control and eye instability can only be addressed with effective training procedures. (Bachman and Inde, 1975; Faye, 1976; Mehr and Fried, 1975; Sansbury et al, 1973; Timberlake et al 1972; Macj et al, 1978; Dubois and Collewijn, 1979; Steinman and Cunityz, 1968). Goodrich and Holcomb 1976, Goodrich and Quillman, 1977).

Although low vision specialists agree that some training is necessary for patients with macular loss, (Bachman and Inde, 1975, Faye, 1976, Mehr & Fried 1975; Jose and Watson, 1973; Watson and Jose, 1976; Goodrich 6 Holcomb, 1976; Goodrich and Quillman, 1977; Quillman 1980; Salmon, 1982) there is a dearth of systematic research and description of evaluation and training procedures for rehabilitating the visual skills of patients with central field loss.

To help patients reach their reading goals, an effective low vision specialist will tailor an individualized training program to foster patients' awareness and ability to achieve appropriate visual skills. This individualized training program for reading usually includes teaching the patient new techniques of localizing, fixating and scanning by consistently using an undamaged area of the retina.

Even these informal training programs reported in the literature lack a systematic method of measuring baseline visual skills for reading and further lack a method of documenting progress other than patient satisfaction. Available reading tests such as the Durrell Analysis of Reading Difficulty (Nicholson, 1975) and the Gray Standardized Oral Reading Paragraphs (Bauman, 1973; Bauman, 1974; Maxfield, 1927; Nolan, 1962) have been used for assessing all aspects of reading skills in low vision children but not low vision adults. Other visual skills tests, such as the Visual Efficiency Scale (Barraga, 1964; Barraga, 1970; Barraga, 1970; Harley and Spollen, 1973; Harley and Spollen, 1973; Proger, 1973) have been developed and standardized for low vision children but not for low vision adults. Because adult patients with adventitious macular damage who wish to read again are most often former accomplished readers, we assume that poor reading is due to faulty visual recognition resulting from macular damage, rather than poor comprehension or understanding abilities. We also assume that problems arising from adventitious macular damage (in adults) may create different visual difficulties than problems arising from congenital macular damage (in children). In order that eye care and other low vision specialists be able to effectively aid adult patients with adventitious macular damage to achieve their goals in reading, effective methods of measuring and training visual skills must be more fully developed and their efficacy documented.

Correct and consistent visual skills depend on correct and consistent eye movement. It is important that the low vision specialist be able to observe, and reinforce correct eye movements, discourage incorrect eye movements and provide the patient with opportunities to practice correct eye movements for consistency.

Low vision specialists confront a unique disadvantage in that they are unable to precisely observe the behavior they are trying to modify. The instrumentation had not been developed for measuring eye movements in individuals unable to maintain steady gaze. Without such instrumentation not only are the low vision specialists unable to observe precisely the eye movements they seek to modify, but they are unable to apply one of the best documented techniques for modifying eye movements, biofeedback (where a tone reinforces correct eye movements). The biofeedback technique has been effectively applied to modifying gaze angle and quelling nystagmus (Lawwill, 1966; Shor and Flom, 1975; Flom, Kirschen and Bedell, 1980). It requires an instrument that can precisely measure horizontal and vertical eye position of individuals unable to maintain steady gaze. A major priority was to develop such an eye movement recording system with the ultimate goal of applying biofeedback training procedures.

We faced a striking lack of research on visual skills, eye movements and reading skills associated with central field loss. Not surprisingly there was little agreement among low vision specialists on the types of eye movement problems encountered by a patient with macular damage and the most effective training techniques for addressing these problems. Our first priorities were to develop a functional assessment procedure relating to reading skills and a method to Objectively measure eye movements during reading (Objectives 1 and 3), reading difficulties being the most common complaint by this population (Goldish, 1972). The functional evaluation instrument will allow low vision specialists to establish baseline performance and document progress in visual skills for reading. Moreover, such an objective assessment procedure will enable administrators and researchers to evaluate and refine programs and training techniques designed to rehabilitate reading in these visually impaired adults. Having developed methods for objectively measuring visual skills and eye movements, we sought to evaluate and develop methods for teaching visual skills necessary for reading (Objectives 2 and 4).

V. TARGET GROUP:

The target population for this study is individuals with adventitious macular damage who were able to read to their satisfaction before the onset of macular degeneration. These individuals present as low vision patients whose primary goal for rehabilitation is reading. Subjects for this study were nonsystematically selected from this target population of persons who had applied for appointments at the William Feinbloom Vision Rehabilitation Center (WFVRC).

VI. METHODOLOGY:

A. SUBJECT SELECTION

Twenty-two subjects were originally selected via the appointment waiting list from the WFVRC. The research study was explained to them and in return for their participation they were provided a low vision examination including an ocular health check and three training sessions with loaner low vision aids, if appropriate. Four subjects were deemed inappropriate for the study and data collected on them was not included in final tabulations. Of these four, after clinical examinations, two subjects were found not to have macular damage and two subjects chose to terminate themselves from the study.

B. DEVELOPMENT AND EVALUATION OF ASSESSMENT TECHNIQUES

OBJECTIVE 1: DEVELOPMENT OF VISUAL SKILLS FOR READING TEST.

In order to evaluate visual skills for reading, reading cards such as the Sloan Reading Cards (Lighthouse Low Vision Service, New York) and The William Feinbloom Sub-Normal Vision Reading Card for the Partially Sighted (Designs for Vision, New York) are often inappropriately used to measure visual skills. These reading cards present meaningful text or sentences and vary task difficulty by varying print size. These tests are designed to determine reading acuity rather than visual skills, and a subject's performance is limited by acuity and visual skills. Meaningful sentences allow readers to infer words from contextual as well as visual cues. A patient with superb reading comprehension skills but with very poor visual skills may read these sentences as accurately as another reader with poor overall reading comprehension skills but excellent visual skills. Such results might lead the low vision specialists to cease visual skills training of the patient with poor visual skills (but good comprehension) before that patient's full potential was realized and continue ineffectual visual skills training with the patient who had good visual skills but poor comprehension.

Using standards already accepted in the fields of reading and low vision (Jose and Watson, 1973; Quillman 1980; Harris and Sipay, 1975; Bachman and Inde, 1975; Daniels 1976 and Dolch, 1936), we increased the difficulty of printed materials by increasing word length and decreasing line and word spacing, variations that will require increasing skill in visual scanning. All words used in the printed materials were vocabulary at or under an eighth grade reading level.

The Visual Skills for Reading Test was designed for low vision specialists to administer to their patients and score in approximately 15 minutes' time. The test consists of 4 white rigid cards with flat white finish (see Appendix B.1). Each card is printed in black with 13 lines of pica type. A line by line description of the test is included in Chart 1.

CHART 1

Line number	Localization aid	Symbol length	Symbol spacing	Line spacing
1	black border	1 letter	double	triple
2	white border	1 letter	double	triple
3		1-2 letters	double	double
4		1-2 letters	double	double
5		3-4 letters	double	double
6		5-7 letters	double	double
7		7-10 letters	double	triple
8		1-10 letters	double	single
9		5-7 letters	double	single
10		7-10 letters	double	single
11		4-10 letters	double	single
12		3-10 letters	single	single
13		3-10 letters	single	single

Lines 3,8,13 were not included in scoring the test. They functioned as "dummy" lines in order not to simulate the white border effect for lines 4,9 and 12.

Each card of the 4 card set was imprinted with an identical test in one of 4 sizes: 3M, 2M, 1.5M and 1M to correspond to the approximate size of newspaper headlines, subheadlines, large print and newsprint respectively. Five versions of the test, each with the format described in Chart 1 were devised. A different version of the test was administered at repeat testings to avoid the patients' memorization of test items. An example of the score sheet for the Visual Skills for Reading Test is included in Appendix B.2)

From the score sheet the evaluator would be able to note:

1. Patient's overall test score in percentage.
2. Most prevalent types of recognition errors.
3. Word length patient is able to recognize correctly.
4. Whether word and/or line spacing affects patient's word recognition.
5. Number of lines not read with greater than 80% accuracy.

The administration of the test was terminated before completion if:

1. The patient wished to cease.
2. The patient made 10 consecutive errors.
3. The patient "skipped" the appropriate line more than once.

4. The patient required more than 10 minutes to finish the test.

If the test was terminated the remaining items were scored as "terminal omissions".

EVALUATION OF THE VISUAL SKILLS FOR READING TEST.

By design, test results could be described at a nominal level of measurement; that is a simple description in terms of word length, line and word spacing would indicate a client's best performance. The last line read with fewer than 20% errors was considered the "best performance". This would enable the low vision specialist to describe the results in simple, functional terms. A second objective was to be able to describe results at an ordinal level of measurement, on a scale of 0 to 11 with the numeral indicating the number of lines missed. Zero indicating no lines missed (read with 20% or fewer errors) and 11 indicating all lines missed. "Test mastery" was no more than 1 line missed. Reading speed could be computed as number of words recognized correctly divided by time elapsed to read them. Test-Retest Reliability was determined by correlating different forms of the same test administered on different days. As no other comparable tests are available, "validity" could not be determined by correlational techniques.

PROCEDURE FOR EVALUATING THE VISUAL SKILLS FOR READING TEST

The Visual Skills for Reading Test (VSRT) was administered before any services were performed (see Visual Instruction Procedures Appendix B6) The test card with the smallest print a subject could see was used (TEST 1). The subjects then received a social services intake and a complete low vision examination resulting in a tentative prescription of magnifying lenses that produce acuity sufficient to recognize 1M print. Following the exam and before any training, subjects were administered TEST 2, using the tentatively prescribed aid. Tests 3, 4, and 5 followed subsequent training sessions. The Visual Instruction Procedures are detailed in Appendix B6 and are summarized below:

1. TEST 1: Pretest before any services delivered;
2. TEST 2: with optical aid but prior to training;
3. TEST 3: post-first training session;
4. TEST 4: Post-second training session; and
5. TEST 5: post-third training session.

A repeated measure with single subjects design was thus employed. Subject needs were considered to have priority over experimental needs. In some cases changes were necessary in the optical aid during the course of the study. In order to maintain comparable training conditions across subjects we deleted data from a given analysis according to the following criteria;

1. Character sizes were found not to be within a subject's acuity limits (either too large or too small);
2. Changes had been made in the magnification of the optical aid; or
3. Any signs of active pathology emerged during the course of the study.

Clinical policy prohibits dispensing an aid without training because patients become discouraged and will refuse to use the aid and resist future training efforts. Moreover, improper use of an aid can result in perilous mobility situations. A control procedure wherein subjects were given aids without training and tested at the same time intervals as our experimental group would have permitted us to compare training with no training conditions. This was rejected because of the above-mentioned risks to the subjects.

All tests were scored from tape by persons unaware of test administration conditions.

OBJECTIVE 3: DEVELOPMENT AND EVALUATION OF AN INSTRUMENT FOR MEASURING EYE MOVEMENTS

Although a number of eye movement recording systems are available, all of them require that the subject whose eyes are being monitored precisely fixate to small targets of known angular separation in order to calibrate the instruments. Patients with macular field loss are unable to maintain the requisite steady gaze. Thus these systems cannot be used with this subject population.

In the original grant application, we proposed using an SRI Double Purkinje Image Eyetracker, with stimulus detector and a specially designed ophthalmoscope that would enable us to calibrate the system without requiring steady gaze. Unfortunately, however, delays in equipment availability put this system out of the project period. We proceeded to design and build an alternate system that was more certain to work at a higher level of performance with the only drawback being that it requires the use of a contact lens. The alternate system is a Magnetic

Search Coil Eye Tracker.

C. DEVELOPMENT AND EVALUATION OF TRAINING TECHNIQUES

OBJECTIVE 2: FUNCTIONAL TRAINING TECHNIQUES

The Low Vision Specialists at the William Feinbloom Vision Rehabilitation Center have developed an informal standard of training procedures. These training procedures were adapted by the investigators of this project to aid subjects in relearning to read. There are five major components to the adapted training procedure. These include:

1. A discussion with the subject of his/her eye condition described in lay terms. This included the implications of reduced visual acuities, damaged macula and resulting central field loss, illumination concerns and resulting complications in viewing.
2. A functional exploration of the subject's best and most consistent eccentric viewing position while localizing, fixating steadily and scanning objects as targets.
3. Using the most appropriate illumination, an establishment of the subject's best and most consistent eccentric viewing position while localizing, fixating steadily and scanning objects as targets.
4. A transfer of these visual skills for recognition to printed symbols including letter and word recognition exercises as targets. Introduction and training in the use of the tentatively prescribed optical aid(s). The most appropriate illumination is maintained.
5. A transfer of the subject's visual skills for reading and use of the optical aid(s) to commercially available material as targets (e.g. newsprint, magazines, mail, bills, etc.)

OBJECTIVE 4: EVALUATION OF BIOFEEDBACK INSTRUMENTATION FOR TRAINING EYE MOVEMENTS

The elderly patient experiencing a loss of central vision over a few years must break a longstanding habit of looking directly at objects in order to see their fine detail. With macular loss, such an eye movement would position the image of the target in the central blind area and it would disappear from view or become blurred. Whereas some individuals can readily change these habits, (judging from their reading performance), others have considerable difficulty. The biofeedback procedure was developed for those who have considerable difficulty maintaining a clear and consistent view of a target. Following the development of an eye tracker with appropriate optics, a Digital Equipment Corporation, Lab 11/23 computer was equipped for on-line control and data analysis. The computer monitored stimulus position and eye position, and reconstructed image position on the subject's retinal surface. The development of this system proceeded in four stages.

Our first stage of evaluation involved testing patients with macular field loss. First we defined the central scotoma (blind area) with macular field loss using dynamic perimetry. While a subject's eye position is measured, he/she views a stationary target. A small (1 degree) spot of light is moved in such a way that its position on the retinal surface moves. Unlike standard clinical perimetry measurement, retinal image position of the target is known at all times. When the target image moved within the damaged macular region, the patient reported its disappearance from view by pressing a button. Allowing for the subject's reaction time, the location of the damaged retinal region was stored for later graphic display. Stage two was an extension of the perimetry procedure where characters from an acuity chart (rather than a spot) were projected onto the surface of the retina, and the region of best acuity determined for a subject. Stage three was a determination of what eye movements were "optimum" for reading by measuring eye movements of subjects who had a central field loss for 2-5 years, and were reading newsprint. Stage four employed auditory feedback to signal to the patient when the target was within the retinal region of best acuity. Subject performance is evaluated in terms of:

1. Changes in eye position,
2. variability of eye position,
3. eye velocity,
4. visual acuity and
5. performance on the VSRT (described above) before the first and following each biofeedback training session.

VII. RESULTS

OBJECTIVE 1: EVALUATION OF THE VISUAL SKILLS FOR READING TEST

A Visual Skills for Reading Test was developed which allows a low vision specialist to assess in approximately 10 minutes the low vision patient's accuracy in recognizing printed symbols. The test-retest reliability of the Visual Skills for

Reading Test was determined on the basis of number of lines missed, an ordinal level of measurement. The correlation coefficient (rho=0.88), indicates a high degree of reliability. These results must be considered preliminary until counterbalanced reliability estimates are derived for all forms.

OBJECTIVE 2: EVALUATION OF A TRAINING PROCEDURE

H: Near optical aids that restore acuity to enable the patient to recognize 1M print are not sufficient to rehabilitate reading skills.

This analysis required comparisons of VSRT results both pre- and post-low vision aid prescription. The largest print size of the VSRT was not recognizable to some subjects before low vision aids were prescribed. Because of these facts, subjects selected for this analysis were only those who were able to recognize the largest print size available and were administered the VSRT prior to the low vision examination.

Following the initial session (evaluation and prescription of a near optical aid) 6 of the 17 subjects included in this analysis (35%) mastered the test by missing no more than one line. The mean percentage of 67% (SE = .28) words were read correctly with a median number of lines missed being 5 (range = 0-11). The fastest reading speed recorded among subjects was 60 wpm, however the mean was 18 wpm (SE = 15) across subjects. The results of our limited sample supports the widely held view that simply prescribing optical aids may not be sufficient for most reading needs as defined by "mastery" of the VSRT. "Mastery" assumes reliable word recognition of conventional text at an 8th grade vocabulary level.

Figure 1 summarizes a sizable increase in percentage of words read correctly and reading rate and a decrease in lines missed that was attributable to use of the aid alone. Performance for most patients however, was still well below that necessary for most reading needs. These results point out sizable individual differences in need for reading skills training and a need for objective visual skills assessment following prescription of an aid. We now turn to the question of the efficacy of training.

H: A visual skills training technique that emphasizes patient awareness, control of eye movements, and practice with word recognition exercises does result in an increase in 1) reading speed 2) percentage of words correctly identified, and 3) a decrease in lines missed on the Visual Skills for Reading Test.

Following prescription of a tentative aid, the training procedures resulted in an additional two subjects achieving mastery of the Visual Skills for Reading test increasing the percentage of subjects achieving mastery from 35% to 47%. Figure 2 indicates statistically reliable increase of 11% in the (mean across subjects) percentage of words read correctly over the 4 training sessions. It also shows a decrease in the median number of lines missed from 5 to 2.5. Once a criterion reading accuracy is met, the low vision specialist turns to the task of increasing reading speed. We examined changes in reading speed from one training session to the next for each individual subject who achieved mastery on the Visual Skills for Reading Test and found no significant changes (figure 3). This training procedure is not as effective in increasing reading rate of those subjects who can read accurately, however, it was effective for increasing the reading accuracy of our subjects.

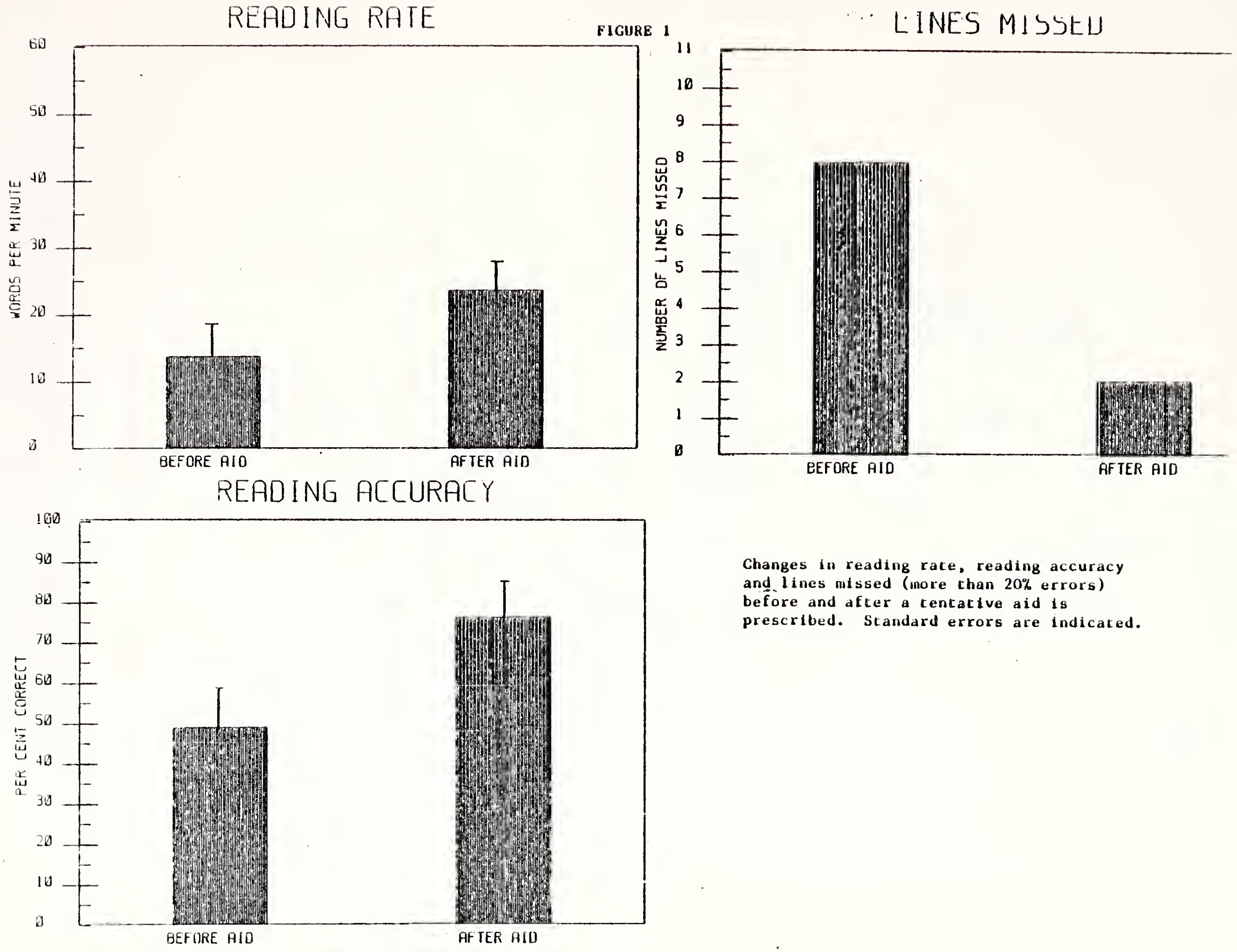
OBJECTIVE 3: EVALUATION OF THE EYE TRACKER

H: An eye position monitor can be constructed that will resolve horizontal and vertical eye position within 10 minutes of arc over a 40 degree range.

The performance characteristics and detailed evaluation procedure are attached as Appendix B5. To summarize, we found that the system could be objectively calibrated to resolve eye position over a 40 degree range to better than 5 minutes of arc in both horizontal and vertical directions. Six low vision subjects have been tested over a 30 minute time period. The fixed results of the evaluations of their gaze patterns are summarized in figure 4 for two patients, one who was able to read newsprint (ED) and another who was not (HY). The system could be constructed for under approximately $5000 and thus could become available to other specialized low vision rehabilitation facilities and used for 1) visual fields evaluation, 2) evaluation of eye movements, 3) determination of optimal gaze angle and 4) biofeedback training. The low vision specialists can for the first time accurately observe the behavior to be modified. No other system with comparable performance characteristics exists that can be used with low vision patients unable to maintain steady gaze.

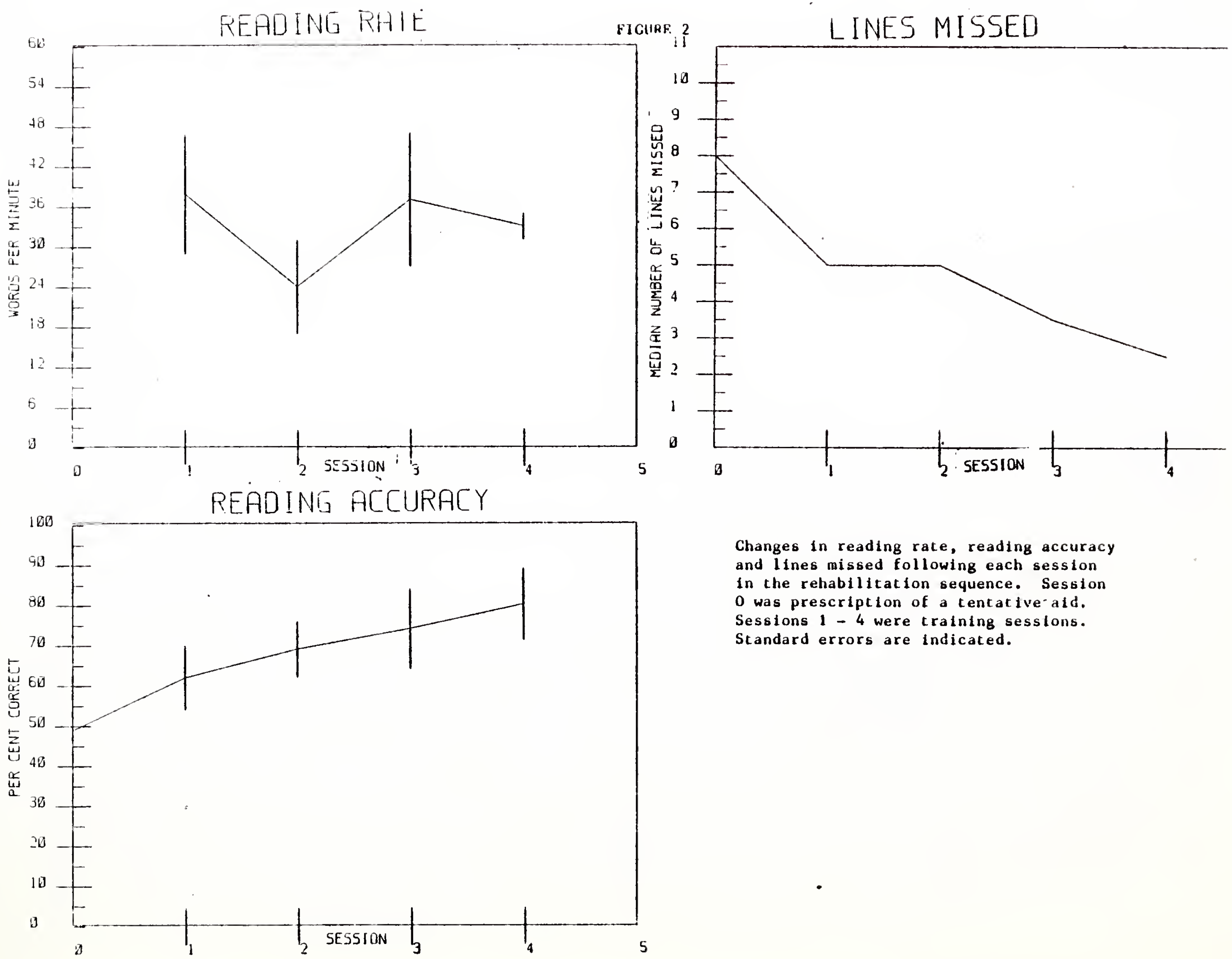
OBJECTIVE 4: ASSESSMENT OF EYE MOVEMENTS, AND TRAINING

FIGURE 1



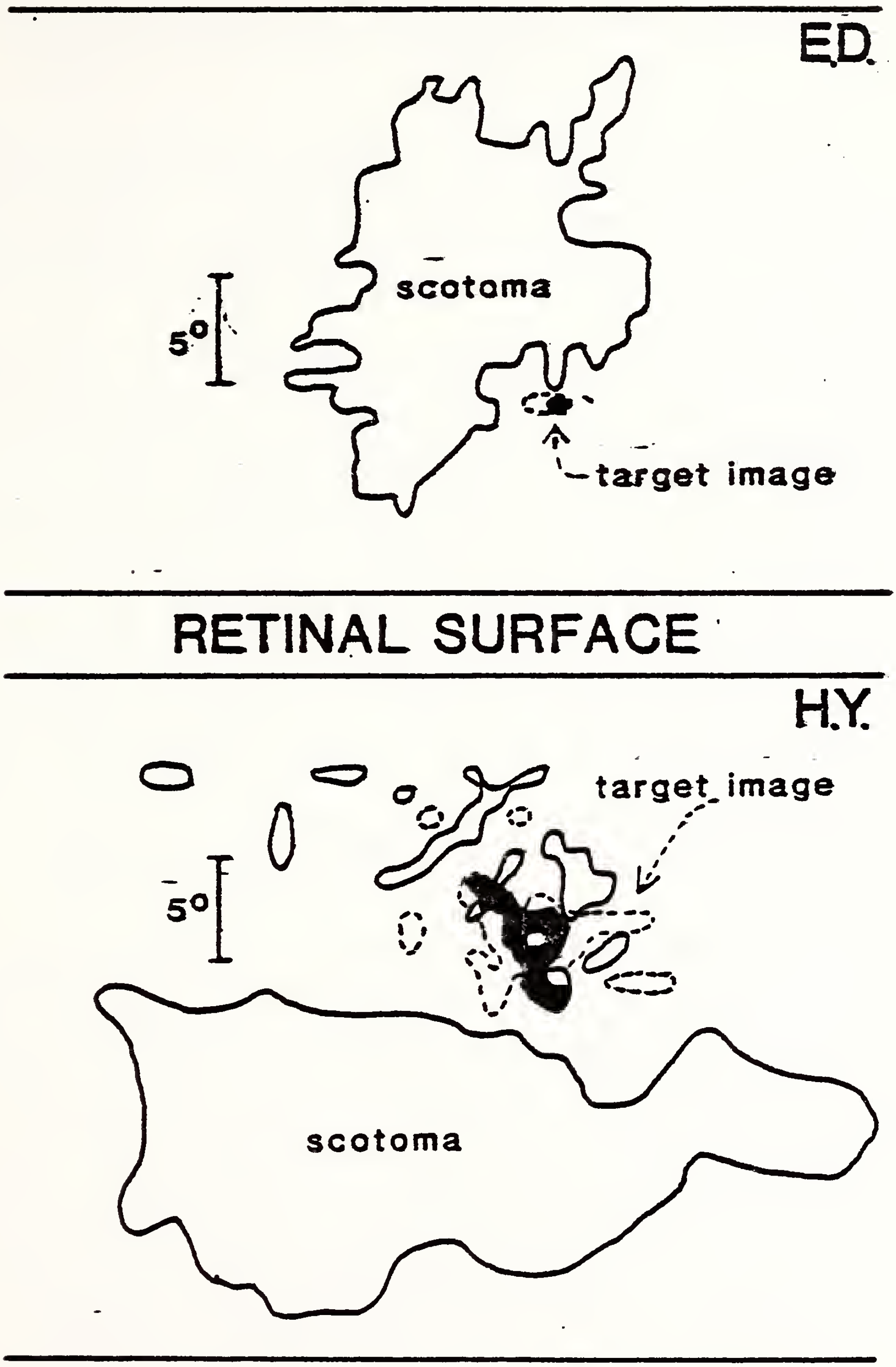
Changes in reading rate, reading accuracy and lines missed (more than 20% errors) before and after a tentative aid is prescribed. Standard errors are indicated.

FIGURE 2



Changes in reading rate, reading accuracy and lines missed following each session in the rehabilitation sequence. Session 0 was prescription of a tentative aid. Sessions 1 - 4 were training sessions. Standard errors are indicated.

FIGURE 3/4



The solid line circumscribes a scotomitous (blind to a 1° test spot) areas on the retinal surface of two patients. The dashed line defines the area where the target image was positioned. The solid region defines the area where the target image was positioned for the greatest relative dwell times (totaling 33% of total fixation time). The dashed area circumscribes the area where the greater relative dwell times totaled 66% of total fixation time. Subject ED could read 1M print. Subject HY could not read 1M print although both had requisite visual acuities.

WITH AUDITORY FEEDBACK

H: An auditory biofeedback system can be used to teach a subject eye movements that optimize character and word recognition acuity.

Using the Search Coil Eye Tracker, we confirmed earlier findings that normally sighted individuals could use auditory feedback to maintain an eccentric viewing position. Within 5 minutes a normally sighted individual could position a target image in an eccentric area 1 degree by 1 degree.

The use of the system for measuring the extent of the scotoma in low vision patients has been only partially successful. For two of the 6 subjects tested, eye position was highly variable during field testing with the image moving rapidly in and out of the scotomatous region, faster than the subject could indicate when the target disappeared and reappeared. Estimates of scotomatous regions were quite unreliable. We are currently adding high speed mirror deflectors that will move the target in conjunction with the eye, stablizing a target on the retina of even a rapidly moving eye. This procedure should increase the reliablity of the field measurements and decrease the administration time.

Q: What is the variability of eye position that optimizes acuity of a patient with central field loss who eccentrically views a target?

A proposed series of systematic studies to address this question was stricken from the original proposal, so we took a short cut. We examined the eye movements of individuals who had developed macular field loss in adulthood and who had adapted to the condition over a minimum of 5 years with optical aids. These individuals reported that they regularly read newsprint. We assumed that they had developed optimal eye movement patterns. Figure 4 represents, on a map of the retinal surface, the scotomatous area and the area where the subject positioned the image of a character which was at the limit of their visual acuity. Subject ED, who had a positively diagnosed macular degeneration for 28 years, would direct a target image into a preferred retinal region within 2 saccades and maintain that image within an .75 x .75 degree area. Subject HY, however, had a more recent onset of the problem. In figure 4, the target image position varied in position over a considerably larger approximately 2.75 x 2.75 degree area, overlapping scotomatous regions. This subject reported difficulty in maintaining a clear view of the target. These studies are continuing and current preliminary findings indicate that an optimum criterion for the auditory feedback training is approximately 1 degree by 1 degree.

During this project period we developed and fully tested the instrumentation with six low vision subjects and four normally sighted subjects. We have obtained information about the eye movements of low vision subjects who have adapted to the extent that they can read newsprint. This information is sufficient to enable us to approximate an optimal viewing pattern and apply biofeedback training to teach adaptive eye movements to subjects with poor visual skills for reading. Studies of the biofeedback training procedure and its effects on character recognition are just beginning and will continue for at least 3 years with support from Grant R01 EY04754-01 from the National Eye Institute.

VIII. CONCLUSIONS:

This project has achieved the stated objectives by:

1. developing a reliable test that permits the low vision specialist to objectively evaluate visual skills for reading in low vision patients and thus enabling the specialist, administrator and researcher to objectively document a client's progress in a rehabilitation program and devise an individualized program to meet specific needs;

2. documenting that although low vision magnification aids improve visual skills for reading, in most cases studied, aids alone are insufficient to rehabilitate visual skills for reading to a level where the subject can reliably scan and read single spaced lines of text comprising no greater than an 8th grade vocabulary;

3. documenting that a low cost training procedure requiring no specialized apparatus does improve visual skills for reading in a group of patients;

4. designing, constructing, and fully evaluating the first system for measuring horizontal and vertical eye position in the low vision patient unable to maintain steady gaze, thus enabling the low vision specialist to evaluate eye movements.

5. determining an approximation of eye movements that optimize character recognition acuity in patients with macular damage and;

6. developing instrumentation for future studies of biofeedback methods to systematically modify the eye movements of low vision patients.

A case study and illustrations of project patients with macular damage and a discussion of low vision rehabilitation in the project follows. The illustrations and discussion will help to clarify and demonstrate how achievement of these project objectives will affect the rehabilitation of reading skills of individual patients.

Mr. S. is a retired 78 year old with senile macular degeneration. Prior to the onset 4 years ago, Mr. S. read a daily newspaper, a weekly news magazine and a monthly sports journal as well as other items for pleasure reading. A retired sewing machine mechanic, Mr. S. was formerly accustomed to seeing fine detail while maintaining excellent eye-hand coordination at arm's lengh. Mr. S. had enjoyed driving and gardening and was presently unable to discern scenery and street signs when riding in a car, or pick berries when gardening. One of Mr. S's primary concerns was his inability to aid his granddaughter in completing her homework, a pleasure he had been unable to enjoy for four years.

With the aid of a hand-held magnifier he had purchased at a department store, Mr. S. was able to pick out some letters in newspaper subheadlines, but was unable to read anything consistently. Mr. S. stated that he was never able to see more than a part of a word and reading was too frustrating to continue. Like many patients with macular degeneration, Mr. S. had adopted rapid random scanning eye movements that functioned to perceptually "fill-in" the gap in his visual field so that he was unaware of the existence of his blind spots.

Mr. S. was referred for low vision services by a local rehabilitation agency. As he reported, he had been told by his eye care specialist "you'll never be completely blind, but nothing more can be done to enable you to see better."

In his appointment request letter to the Feinbloom Center, in addition to reading, Mr. S. added T.V. viewing to his desired goals. Since Project II was designed to examine reading specifically, the goal of T.V. viewing was addressed later by non-experimental appointments in the WFVRC.

Mr. S. was channeled through the project according to the Visual Instruction Procedures (Appendix B-6). During his initial appointment Mr. S. was administered a pre-test of the VSRT before he received an examination. He was able to finish the pre-test with a total score of 58%; most common errors were partial mispronunciations (17%) and omissions (18%). He was unable to consistently read word lengths greater than 1 character with double line and word spacing. He missed 9/11 lines. These results reiterate his own reports of reading difficulties.

During the optometric examination Mr. S's acuities were revealed as:

	Distance	Near
O.D.	10/100	2M (corresponds to large print symbols)
O.S.	10/80	1.6M (corresponds to large print symbols)

No significant refractive error was noted. A 4X microscope (spectacle mounted magnifier) was tentatively prescribed which improved acuity in the left eye to .8M (corresponds to small print symbols). Due to the difference in the acuities in the two eyes, Mr. S. did not have binocular vision. Optical aids were prescribed only for the left, dominate eye. Due to Mr. S.'s unstable fixation, his visual fields were not plottable with precision, but were noted as central scotomas, O.U.

Mr. S. eccentrically viewed with his left eye by looking above a target. Lighting needs were noted as 200 foot candles on the page directed over the left shoulder. This light was maintained throughout the training sections and practice at home.

After 3 training sessions and practice with the 4X microscope at home (see Obj.2, p.2.28 training procedures) Mr. S's VSRT scores improved to 97%. Mispronunciations were noted as 2% of the test and omissions were 1%. He achieved mastery indicating an ability to read up to 10 letter words with single word and line spacing. Further, Mr. S. was able to resume reading the newspaper and his magazines at home with appropriate lighting. He resumed, after four years, aiding his granddaughter with her homework and reported deriving great satisfaction from his regained reading abilities.

As is often the case, Mr. S. had previously experienced frustration in his attempts to seek help for his visual dysfunction. In spite of good primary eye care, and his use of a commercial magnifying device, Mr. S. was still unable to read. Through the auspices of the WFVRC and this project Mr. S. was able to achieve his goals for near tasks. There is excellent potential for his goals for distance tasks to be met through further evaluation, different optical aids, training and practice.

One impact of the results of this project is to simply document that patients like Mr. S. have visual skills problems, including scanning eye movements, that 1) contribute substantially to loss of visual function, and 2) in many cases, cannot be solved by simple magnification aids without appropriate training. Careful documentation of this problem is a first step in convincing ophthalmologists and optometrists who do not specialize in low vision rehabilitation of the need and effectiveness of certain rehabilitation services.

Whereas our specific rehabilitation procedure worked for Mr. S., it did not for others. One value of the VSRT is that failures to progress become obvious before time and effort are wasted. In two cases studied in this project, as a direct result of a failure to progress on the VSRT test, a reevaluation was done. These diagnostic evaluations revealed retinal hemorrhaging in one patient who was immediately referred for medical treatment. In the other patients, identification of problems in training led to increasing the amount of aid magnification and resulted in substantially improved performance on the VSRT.

Before this project was initiated, the response of low vision specialists to a patient's failure to progress was usually one of trial and error; shifting training strategies or trying new aids until some improvement was noted. This process is often time-consuming and frustrating for both the eye care specialist and the patient.

With the newly developed eye tracking system however, these patients can be referred for additional testing. The size and location of scotomas and optimum viewing angles can be detected more precisely than has been possible before. (One of the difficulties with all patients with macular damage in this project was the inability to precisely determine this information due to unsteady fixations). Moreover, the types of eye movement patterns and their contribution to loss in visual function can be assessed. For patients who do not show improvement via functional training procedures, biofeedback training with the eyetracker instrumentation may enable them to stabilize gaze and improve the ability to eccentrically view.

The documentation of the informative and exciting results of this project will have significant influence on the rehabilitation of patients with macular damage who wish to remain productive, active and independent through reading.

IX. Research Utilization Plans:

Plans for dissemination and utilization of research results takes several forms (other than those already described):

1. Patient records and results of evalution and training will be added to the WFVRC database and expanded in a program to compare results and generate further statistical information on this project.

2. The development of the project and research results will be submitted for presentation at national conventions attended by professionals in the fields of eye care, research and low vision. In order to reach eye care specialists to convince them of the importance of rehabilitation and visual training for patients with macular damage, the project will receive exposure via a presentation at The Association for Research in Vision and Ophthalmology. To reach optometrists, a paper entitled "Reading with Macular Damage" will be submitted to the American Academy of Optometry for presentation in December 1983.

   Rehabilitation specialists and educators will share a joint American Association of Workers for the Blind/Association of Educators for the Visually Handicapped Meeting in 1984. In order to reach both these groups with results of the field testing of the Visual Skills for Reading Test, a presentation will be submitted for this convention.

3. Journal articles will be generated to

disseminate the project information and its results using specific topics such as "Functional Training for Eye Movements in Reading for patients with Adventitious Macular Damage", "The Development and Field Testing of a Visual Skills for Reading Evaluation", "Biofeedback as a Training Technique for Eye Movements in Senile Macular Degeneration Patients" and "Eye Movements and Visual Acuity in Patients with Maculopathies." These articles will be submitted to _Investigative Ophthalmology and Visual Science_, _Journal of Visual Impairment and Blindness_ and _Review of Optometry_ in order to reach the broad base of interdisciplinary professionals who service this target group.

4. We plan field testing of the Visual Skills for Reading Test. We have been approached by interested professionals at other low vision services such as the Low Vision Clinic at the College of Optometry in Houston and the Michigan Association for the Blind who wish to explore the use of the Visual Skills for Reading Test as field-test sites. Our plans include:
   a. Development of an information manual directing the administration and scoring of the Visual Skills for Reading Test.
   b. Field testing of The Visual Skills for Reading Test at other low vision service sites. Comments and suggestions for improvement wil be invited. Data will be collected on patients to whom it is administered.
   c. Modification of the VSRT based on field test comments and results. If the VSRT is considered a needed evaluation tool in the field of low vision, advice on marketing will be sought from low vision product marketing professionals such as those at American Printing House for the Blind or American Foundation for the Blind.

5. Reports of the project and research results will be disseminated by WFVRC and PCO staff professionals at workshops, inservices and presentations on low vision. The Pennsylvania College of Optometry has obtained a federal grant from the Office of Special Education to provide a series of workshops in low vision for special educators; this and other research reports are included in the workshop curriculum.

PROJECT #3

The development and assessment of training protocols for the use of Fresnel prisms by persons with peripheral field defects: Effects on independent travel and psychosocial adjustment.

PRINCIPAL INVESTIGATOR(S):	Discipline	% of Time
Audrey J. Smith, M.Ed.	Mobility	20%

MAJOR CONTRIBUTORS:

Ann Barber, M.Ed.	Mobility	20%
Richard Brilliant, O.D.	Optometry	10%
Sarah Appel, O.D.	Optometry	10%
Sheree Aston, O.D.	Optometry	10%
Judith Sharko, M.Ed.	Mobility	10%

FUNDING:

Project 3 received 13% of the overall budget. This included 10.4% from NIHR and 2.5% from PCO. The federal grant totaled $342,924 and the college contributed $43,681.

ABSTRACT:

Peripheral visual field defects such as those which occur in persons with retinitis pigmentosa, glaucoma and strokes significantly affect independent movement, even when the person's visual acuities remain relatively good. Research was conducted to evaluate the benefits derived from using Fresnel prisms in conjunction with visual and mobility training. Factors influencing mobility skills and visual performance were examined with emphasis on performance, psychosocial and stress variables. Subjective information was obtained from subjects' journals of their experiences, and from the administration of the Orientation and Mobility Stress and Personal Inventories. Additional information was obtained from the Spielberg State Trait Anxiety Test. All measures were given to each subject before and after receiving prisms. Instructors observations were recorded in narratives and transferred to an O & M Critical Events Checklist. Both clinical and training protocols were developed and/or refined through this project.

Although the subjects finishing the four month research period were few, (6), the indepth descriptive case analyses provided have many implications for service delivery. The Fresnel prisms when combined with training reduced mobility problems and stress levels of all subjects. In one case, training alone made a difference in these same areas without the use of an aid. There are several implications for O & M specialists including a mobility training protocol. Eye care specialists can benefit from such findings, during the pre/post clinical comparisons, as the reduction in visual acuity when wearing 30 prism diopter lenses; and the glare problems experienced by patients, which were significantly alleviated by the prescription of absorptive lenses.

KEYWORDS:

Fresnel prism, peripheral field defects, low vision, mobility, independent travel, psychosocial, stress, training protocols.

PROJECT 3

"Development and Assessment of Standard Training Protocols for the Use of Fresnel Prisms by Persons with Peripheral Field Defects: Effects on Independent Travel and Psychosocial Adjustment"

OBJECTIVES

It is a well recognized fact that large peripheral field defects, such as those which occur in retinitis pigmentosa (R.P.), glaucoma, and strokes can be a severe handicap to persons, even when central acuities remain relatively good. Independent movement is usually the most significant concern associated with such defects, thus affecting one's travel, vocation and daily living situation. The use of Fresnel prisms to enhance one's peripheral field awareness and visual performance has met with varying success by numerous professionals: Bailey (1969), Gadbaw et al (1976), Jose and Smith (1976). However, no formal research has been undertaken to evaluate the benefits derived by the patient from training in the use of Fresnel prisms. The objectives, therefore, of this research project are:

1) to evaluate use of the Fresnel prisms in enhancing peripheral awareness for persons with peripheral field defects

2) to establish a standardized training procedure to improve the capacity for independent travel and visual performance of these individuals

3) to explore the possible impact of the use of Fresnel prisms on the individual's self concept, daily living skills, stress, family dynamics, mobility status, etc.

4) to determine factors other than vision which could assist in predicting successful or non-successful candidates for Fresnel prism training and usage.

LITERATURE REVIEW NEED

Historically, vision research with subjects who have severely constricted visual fields (10 degrees or less due to R.P., glaucoma, etc.) has been primarily concerned with increasing the visual field awareness. This has been attempted through the use of three types of optical devices. These devices are: reverse telescopes (Hoeft, 1980; Newman, 1974; Weiss, 1969), hemianopic mirrors, (Hoeft, 1974; Newman, 1974; Swann, 1974; Weiss, 1969) and Fresnel prisms (Duane, 1980; Bailey, 1978; Faye, 1976; Gadbaw, 1976; Hoeft, 1974, 1980; Jose, 1976; Nerenberg, 1980; Newman, 1974; Swann, 1974; Swann & Fanning, 1976; Weiss, 1969, 1972, 1977).

Contemporary literature specifically related to the use of Fresnel prisms reflects an established disagreeement as to the applicablity of this technique for field-constricted subjects (Bailey, 1978). Authors who consider the prisms inappropriate generally restrict themselves to describing the problems, testing techniques and optics of the prism system. They conclude their studies with a cursory mention of the problems experienced by the low vision client in visually adapting to the prisms (Bailey, 1978; Fonda, 1970; Nerenberg, 1980; Weiss, 1977).

Weiss (1970) initially noted the need for adaption to the "jump effect" caused by shifting direction of gaze into the prism. Hoeft (1974), Margach (1975) and Bailey (1978) described the importance of carefully instructing the subject in the use of field enhancement aids in order to obtain user acceptance. Mehr and Freid (1975) further emphasize the importance of instruction and counseling. Hoeft (1980) goes on to include client motivation as a prime factor in the successful use of Fresnel prisms. These authors and others (Newman, 1974; Swann, 1974) not only considered adaptation training, but also psychosocial factors as important components of the clinical program. Gadbaw et. al. (1976) and Jose and Smith (1976) have looked beyond the purely clinical measures of prism evaluation and examined a series of other parameters including the importance of a period of adaptation and training, the psychosocial factors of patient motivation, and the influence of counseling as critical variables in affecting the outcome of using Fresnel prisms. Gadbaw concludes, "The training program is probably a key element in successful prism training." Thus it appears that professionals who make use of both rehabilitation and clinical methods may have more positive outcomes. This study sought to quantitatively evaluate this approach.

AREAS OF INTEREST/NEED

A joint program of low vision clinical intervention and orientation and mobility training in the use of Fresnel prisms was implemented to evaluate the clinical, mobility and subjective success/failure rates of individuals eligible for Fresnel prism use. This study centered around the following areas of interest/need:

1) Clinical and non-clinical factors important in identifying successful candidates for Fresnel prism use.

2) The effect of Fresnel prism use on enhanced awareness of and interaction with the environment, especially in independent movement situations.

3) Subjects' reports on the effect of Fresnel prism use in stress levels pertinent to mobility situations.

4) Evaluations and subjects' reports on the effect of Fresnel prism use on the number of undesired/unexpected contacts with people and objects encountered while traveling.

5) Subjects' reports on the effect of Fresnel prism use on self-image, feelings of self-worth and generalized stress.

6) Subjects' reports on the major advantages and disadvantages of Fresnel prisms.

7) An eye care specialist's clinical protocol for examination of patients with constricted peripheral fields.

8) A training protocol for use of and independent travel with Fresnel prisms.

METHODOLOGY:

Subjects were drawn from the patient population of the William Feinbloom Vision Rehabilitation Center and Elwyn Low Vision Services, both located in Philadelphia, Penna. When it was determined during the course of their initial visit to the low vision facility that they met basic criteria for inclusion in the research project they were informed of the project and referred. Criteria for inclusion in the project were based on advice from several professionals experienced in working with Fresnel prisms. Criteria included:

1) clinical visual acuity of 20/20 to 20/200;

2) central clinical visual fields of no more than 10 degrees, or;

3) a full hemianopic or quadrant field loss;

4) the absence of major cognitive or motor deficiencies.

Once subjects were informed of the project and agreed to participate, a basic functional visual field screening was performed. This was done by asking the subject to fixate on a stationary target placed at approximately 7 meters. The instructor then stood 1/2 meter to the side of the subject and walked a straight line parallel to the subject's line of sight (first on one side of the subject, then the other). The distance at which the subject first saw the instructor (or any movement at all) was recorded. The criterion of acceptable functional visual fields for eligibility into prism training was a recording of visual detection at one meter or greater. A recording of less than one meter indicated possible peripheral "islands" of vision. In cases such as this, it was felt that training and scanning with the unaided eye was the best initial treatment before pursuing the possible use of Fresnel prisms.

If subjects' functional fields indicated, they were admitted into the program. Subjects were asked to participate at no cost in an experimental study of Fresnel prisms and associated visual and mobility training programs of four months duration. A consent form outlining the study was presented and signature obtained.

After consent was obtained, a series of questionnaires were administered. They are described below and included in the appendices to this report. 1) The Personal Inventory is an instrument devised to reflect overall psychosocial status as measured by generalized questions relating to psychological, sociological and emotional states of being. A higher score indicates a more positive response. 2) Spielberg's State-Trait Anxiety Inventory was used to measure overall emotional stress experienced by the subject as a result of his/her vision loss. A higher score indicates higher anxiety. For more information on these two measures see Project 1. 3) An O&M Stress Inventory was administered to measure the degree of stress the subject perceived in a variety of travel situations. A higher score indicates a higher level of stress. 4) An Orientation and Mobility (O&M) Critical Events Checklist was also administered in selected indoor, quiet, busy and crowded areas. Although environmental conditions could not be strictly standardized, it was felt that only a variety of environments of increasing complexity would truly assess the problems encountered when traveling with a visual field loss. 5) Functional field testing was recorded with the patient gazing straight ahead unaided by prism, and toward areas of visual loss in an attempt to detect a person passing by. Subjects were then asked to view toward the area of visual loss, aided by prism. 6) Clinical acuities and field testing results using arc perimetry were obtained.

Upon completion of these initial measurements, subjects were told they would be evaluating different prisms and each subject was then fit with a 30 prism diopter (▲) lens referred to as Prism #1. The prism was fit first on the eye with more severe field loss. If field loss was equal for both eyes, the prism was fit first on the eye with better visual acuity.

Prism size and placement were determined by the following method:

1) Subject was fit with best refractive correction. If no refractive lenses were necessary, plano lenses were used. Frame size was an important factor. If it was too small, the optimal use of field was cut down. If it was too big, some subjects complained of poor cosmesis. An arc perimetry field test was then performed to determine areas of visual field loss.

2) With lenses on, subject was instructed to fixate on an object approximately 3 meters in front of him/her. As subject gazed straight ahead, the instructor placed a piece of paper on the outer temporal edge of the lens (or area of field loss) and moved it in slowly toward subject's visable field of view. The subject was instructed to tell the instructor when the piece of paper was first seen. The paper was then moved back as the subject still gazed ahead. The spot where the subject no longer saw the paper was marked on the frame. This was repeated 3 times.

3) The piece of paper was then cut to fit the frame and taped onto the glasses. The subject was then required to walk around the clinic determining if the paper interfered with central "straight ahead" vision. If it did, it was cut back and re-evaluated. If it did not, the paper was used as a pattern to cut the prism. Prism was placed on the inside of the lens with the base pointing

in the direction of the field loss. (See Appendix C6 for more detailed information on functional fields and placement of prisms).

If a subject benefited from placement of prism in another area of field loss, this was provided during the initial training sequence. Once the prism was placed, functional fields, as described earlier, were performed with the patient gazing straight ahead and then into the prism (area of field loss). Acuities were also recorded at 5, 10, and 20 feet while viewing through the prism.

After prisms were fit each subject was given a total of fifteen hours of visual and mobility instruction in the use of the prism. (See Appendix C6 for training sequence.) When subject's primary mode of travel was use of a sighted guide, basic instruction in the use of the long cane was provided as part of the mobility training. Subjects were referred for more comprehensive O&M training programs at the completion of the research project.

After the initial 15 hour training period, each subject was instructed to wear the 30 prism diopter lens for the following month, independent of training intervention. The subject was then told to return to the clinic at which time a complete re-evaluation was done of visual acuities both with and without the prism visual fields, the Personal Inventory, the Spielberg's State-Trait Anxiety Inventory, the O&M Stress Inventory, and the O&M Critical Events Evaluation. The subject was then fit with a placebo which was a 1 prism diopter lens, referred to as Prism #2. Clinical acuities were taken while the subject viewed through the prism and functional fields were done with the subject gazing straight ahead and into the prism. The subject was sent home for another month's wearing period, asked to compare the 2 prisms and instructed to return at the end of that month's time. Upon returning to the clinic, after the second month's wearing period, the subject was once again re-evaluated as before. He/she was then offered the prism of choice and instructed to wear it for a month, after which all evaluations were readministered. Clinical acuities and functional fields were taken with the prism of choice.

All evaluations including clinical acuities and fields without any prism were taken at each one month interval. All evaluations were conducted in the same environment each subsequent time. The same O&M instructors conducted the O&M evaluations and used themselves as targets in the functional field evaluations. In each subsequent field evaluation, the subjects were required to look straight ahead and then as far to each side as comfortable, both with and without the prisms. At best this is a gross functional evaluation, since it was impossible to measure the subject's exact eye movements each time. However, the same target size, contrast, distance, and instructors were used at each evaluation to control as many variables as possible.

During the training and wearing period two detailed logs were maintained: one by the instructor during instruction time, and one by the subject during wearing time at home. The logs included cumulative training time, activities of training, impressions, observations, problem areas, subjects record of cumulative practice time, advantages/disadvantages of the prism, changes in life style, feelings/reactions of family members and/or peers and self, general observations, etc.

At the end of the final month's wearing time, subjects were asked if they would wear the prism after the conclusion of their participation in the project. The journal which had been kept by subjects was also discussed. Once again complete re-evaluation of all the previously mentioned areas was performed. If they so chose, subjects were provided with the prism and pair of glasses free of charge and were given a review in prism care and cleaning procedures. When necessary, referrals to appropriate professionals for follow-up care were made.

RESULTS/DISCUSSION:

Although the methodology of this experiment was tightly structured and standard research such as hypotheses and inferential analysis of the data was anticipated in the proposal, problems centered on the clinical nature of this research caused a basic shift to a more descriptive, single subject design analysis of the data. The problems became apparent early in the project and a shift in design, as described in the above methodology was made.

Screening was performed on twenty subjects. Of the original subject pool, only half (10) were determined, through functional field testing, to be good candidates for Fresnel prism training. Of these ten, five completed the entire training and wearing period. Three dropped out completely due to sickness, scheduling and vocational problems. Although two others completed training they were unable to complete the wearing period required in the research protocol.

A total of 7 received training.

Due to the unanticipated time problems with screening and scheduling difficulties involved with coordinating research with Low Vision Clinic schedules, as well as subject related scheduling problems, additional subjects were not included in the experimental protocol. These problems were compounded by a 50% cut in funding for the project resulting in the use of 3 part-time or only an equivalent 50% mobility specialist to conduct the training sessions and obtain the data. Because of this small sample size, it was decided to examine the completed data in a descriptive rather than an inferential manner.

The following are case study reports compiled from outside journals kept by O&M instructors and subjects during the research protocol period. Results from the O&M Critical Events Checklist, O&M Stress Inventory, Psycho-social Personal Inventory and Spielberg's State-Trait Anxiety Scale are also given. These are followed by a summary of the major results of this study.

Subject 1

Subject #1 is a 56 year old male who presented with retinitis pigmentosa, a visual field of 3 degrees centrally and a visual acuity of 20/80 O.U. The subject is married and reported his health to be good. He owns and actively runs a lumber business. His favorite leisure activities are golf and skiing, which he has discontinued due to his vision problems. He first noted problems with his vision thirty years ago. Ten years later, he was diagnosed as having retinitis pigmentosa and his vision has decreased considerably since that time.

The subject stated that he wanted "a cane or anything that could improve his vision and make him more independent. He reported significant problems with glare, particularly outdoors, and is a full-time wearer of Corning CPFS50 sunlenses. Subject 1 further reported his three major mobility problems as follows:

1) "Finding and going down steps"

2) "Traveling in crowded areas and bumping into people"

3) "In social situations, I have to concentrate on one thing at a time and this seriously affects my communication"

Summary of Pre-Training Structured Observations

Clinical acuities were measured to be 20/80 O.D. and 20/80 O.S. unaided. With the Corning lens, acuities were 20/60 O.U. Visual fields were recorded to be 2 degrees centrally O.D. and 4 degrees centrally O.S., with no islands of vision in either eye.

Functional fields were measured as follows: a passerby on his right or left side was detected at 20+ feet when he viewed straight ahead. When viewing to the right, the passerby was detected at 12 feet. When viewing to the left, the passerby was detected at 6 feet.

On his initial mobility evaluation he experienced 59 mobility problems, as recorded in the O&M critical events checklist. Major problems centered around bumping into objects and people and tripping over/into low-lying objects (e.g., raised slabs of cement, potholes, etc.). When queried about his problem with low lying objects he replied, "I just pay atention to what's 10 to 15 feet ahead. I figure I'll pick them up in time." In observing the subject, it was noted that, in actual fact he spent most of his travel time looking at his feet. He also demonstrated inefficient and poor visual scanning abilities. He had great difficulty finding traffic lights for determining when to cross streets. His response was that "I don't look for them, my wife takes care of that." He then stated, "You lose your orientation abilities when you rely on someone else for so long."

Subject #1 was totally dependent during any mobility situation in an unfamiliar area. He relied on his wife as a sighted guide in these circumstances. During his initial visit to the clinic, he shuffled his feet, moved slowly and held his wife's arm to maneuver about the area. In general it was noted that his movement was very slow and cautious.

His O&M Stress Inventory revealed much self-perceived stress in mobility situations at a mean level of 4.11. His Personal Inventory score was 58 and his Spielberg Anxiety State Measure was 2.0.

Subject #1 was fitted with two 30 prism diopter base out lenses placed temporarily on both eyes. Clinical acuities were 20/100 O.U. with the 30 prism diopter lenses on his Corning lenses compared to 20/60 without the prism. Functional fields were measured as follows. A passerby was detected at 20+ feet when he viewed straight ahead. When viewing to the right, through the prism, the passerby was detected at 1 foot compared to 12 feet without the prism. When viewing to the left, the same passerby was also detected at 1 foot compared to 6 feet without the prism.

Summary of Training Period #1 with 30 prism diopter lens

Subject #1 was provided with 15 hours of visual training and instruction in the use of a long cane. He and his wife were also provided with sighted guide instruction, centered around awkward social situations involving such things as maneuvering through crowded areas, finding seats in restaurants and public areas, traveling through dimly lit areas, negotiating stairs, etc.

He responded extremely well and quickly to both visual and cane training and by the end of his training period he was, much to all of our surprise, traveling independently in crowded, downtown Philadelphia. He appeared overwhelmed by his progress and stated that "a whole new world has opened up to me." He was sent home to wear the prism for a one month period.

He returned after wearing the prism lenses and his visual acuities were measured at 20/60 O.U. without the prisms and at 20/100 O.U. with the 30 prism diopter lenses. It was noted that there was an anterior cortical lens cataract near the pupil border in his left eye. His clinical visual fields remained stable. His functional fields were measured as follows: a passerby was detected at 15 feet when unaided, viewing straight ahead. When viewing to the right or left, through the prism, the passerby was detected at 1 foot. His ability to detect someone at his side while using the prism held steady at 1 foot and his ability to detect someone, while viewing unaided, straight ahead improved from 20+ feet to 15 feet. This is an interesting functional improvement, in view of his stable clinical visual field findings.

His post 1 month wearing period mobility evaluation subsequent to this training period revealed 16 problems as opposed to the 59 problems seen in the last evaluation. He was observed to experience a considerable reduction in bumping into objects. His scanning was noticeably improved. The majority of his evaluation was uneventful in relation to object and people contact. He was considerably more aware of his environment and maneuvered through it at a smooth pace with apparent ease. His O&M Stress Inventory revealed a significant reduction in stress levels associated with mobility situations, as reflected in a score of 2.05 compared to his score of 4.11 at the beginning. His Spielberg Anxiety scale measure remained approximately the same, 1.95 compared to 2.0, but his Personal Inventory score improved from a 58 to 77.

The following quotes, excerpted from his journal notes during the first month of wear, reflect his increased awareness, independence and adjustment to the use of prism and a cane.

> "Used cane and prism first day back at work. Was able to go into mill yard and inspect logs. Lots going on around me that I was unaware of before. Use of cane did not make me self conscious at all."
>
> "Feel better about the RP problem than I have in years! Seems great to be able to maneuver around the business without hesitation."
>
> "The prisms compel me to turn my head more to the left and right and I am more aware of my surroundings."

> "Sometimes the prisms cause double vision: movement of my head eliminates that. I continue to use the prism and cane and think less and less about using them."
>
> "My wife says that for the first time in years my shins are not bruised and bleeding!"
>
> "Noticed that I seem to be picking up quite a bit of glare from the prisms the last couple of days. Took them off to clean and decided to go without them for a few hours to see if there is much of a difference. . . There was a noticeable difference without the prism. With prisms you are almost forced into rotating eyes and head. The prisms make one catch glimpses of people and objects to the side and makes you turn your head and eyes. Without the prisms the RP tends to make me stare straight ahead all the time."
>
> "Went with my son up to log job in Booneville today. This is the first time I have gone into the woods in years. I moved around easily and didn't worry about what anyone else thought about my problem. Seeing the cane makes other people aware that I have an eye problem and only an eye problem."

Even his wife made the folowing entry into his journal:

> "Earl is not nearly so tired at the end of the day. Use of the prisms and cane seems to lessen almost all the tension he used to feel when negotiating around the mill and y ard. He now spends better than half his time away from his desk--out where the action is."

Summary of Training Period #2 with 1 prism diopter lens (placebo)

The subject wore 1 prism diopter lenses for a month. Upon returning to the clinic, his acuities were recorded at 20/60 O.U. unaided and 20/60 O.U. while viewing through the 1 prism diopter lenses. His clinical visual fields remained stable. Functional fields were recorded as follows a passerby was detected at 15 feet when viewing unaided straight ahead. When viewing to the right and left, through the 1 prism diopter lenses, the passerby was detected at three feet. This represents an improvement over his initial reading at 6 feet but a decrease in his awareness when using the 30 prism diopter lenses. He experienced an increased in mobility problems during his subsequent evaluation. He went from 16 recorded problems with the 30 prism diopter lenses to 23 recorded problems with the 1 prism diopter lenses. He, nevertheless, continued to perform at a much more efficient level than during the pretraining evaluation. His stress level related to mobility situations though much lower than his initial responses, increased from 2.05 with the 30 prism diopter lenses to 2.40 with the 1 prism diopter lenses. His anxiety level increased slightly to 2.15 and his Personal Inventory score improved to 99.

During his third evaluation he stated, "Notice how much better I am at traffic lights. I don't have to look all over for them. Before I was so busy looking down at my feet, I didn't pick them up ahead of time. Now I can see them ahead of time." This statement confirmed initial observations of how the subject was using his vision prior to training.

Even with the placebo prisms, the subject's mobility performance showed a marked increase over his initial performance. He was now traveling independently and relying on his cane and prism as opposed to his wife for his own mobility. Initially, his wife was very cautious about him traveling alone. She exhibited much more confidence in his travel abilities as demonstrated by her statement, "I don't worry about him anymore. Six months ago I would have been a nervous wreck if he had gone outside alone. Now I don't worry."

Subject #1 discontinued his diary after the first month of wear, but provided verbal comments that the 1 prism diopter lens was more clear, and the 30 prism diopter lens made him more aware or "caused me to look at more things."

Final Evaluation with Prism of Choice

The subject chose the 30 prism diopter lenses. His final visual acuity readings, after another one month wearing period were 20/60 O.U. and while looking through the 30 diopter prisms 20/80 O.D. and 20/70 O.S., representing an improvement over his initial V.A.'s with the 30 prism diopter lenses which were recorded at 20/100 O.U. His clinical visual fields remained stable. His functional fields were recorded as follows: a passerby was detected at 7 feet when viewing unaided, straight ahead. When viewing to the right and left, through the 30 prism diopter lenses, the passerby was detected at 1 foot (constant with previous readings through the 30 prism diopter lenses). The most interesting improvement was in his ability to spot a passerby when he was viewing unaided, straight ahead. He improved his ability from 20+ feet to 7 feet.

His final mobility evaluation revealed 4 problems, a drop of 55 from an original 59 problems. His O&M stress inventory score was at a 2.59 level compared to an original level of 4.11. His anxiety score was down from 2.00 to 1.65 and his Personal Inventory remained improved at 99, as compared to an original 58.

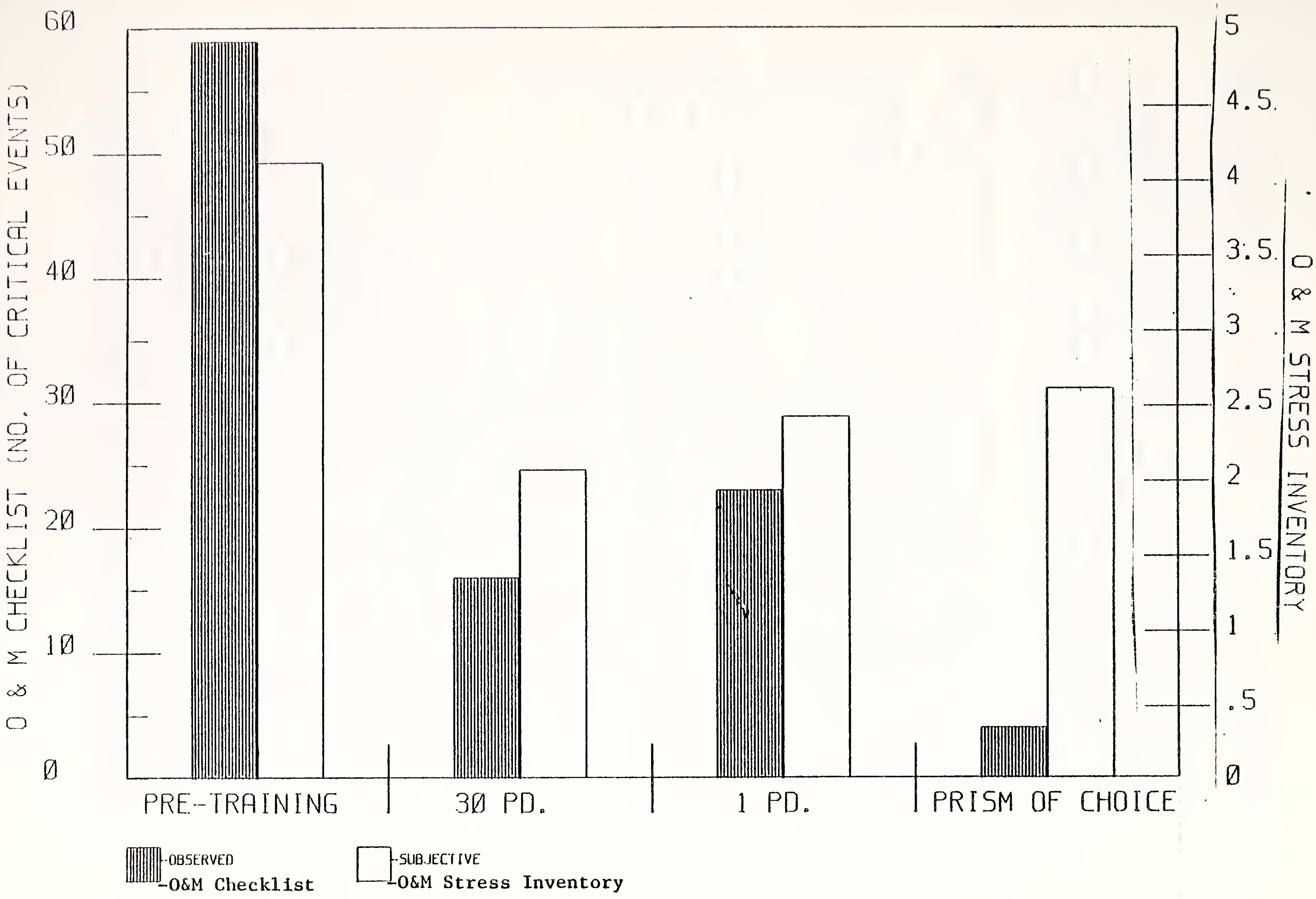
The subject showed a night and day difference from his original mobility performance. He reported achieving almost full independence and his mobility evaluation confirmed this. He demonstrated speed and ease of movement when using his cane and prisms. The subject reported that he felt he was doing fine, though he still felt uncomfortable maneuvering around a lot of equipment.

The 30 prism diopter lenses were selected because they "brought stuff in a lot faster and seemed somewhat stronger." He felt that they "were a great piece of equipment to have on his glasses and that they made it a lot easier for him to travel. He felt most strongly about his long cane use. "I really think the cane has made the biggest difference in my mobility. I wouldn't think of traveling without it. I really think I'm getting along fine in comparison to where I started. I see lots of improvement. I think your mental attitude has a lot to do with it."

On the negative side, he reported that he had previously been content with his poor level of performance and dependence on others. He reported that his expectations were now raised and he was experiencing frustration because of an inability to meet these higher levels of independent functioning immediately. He stated, "Before I started the training, I accepted a lot of things I couldn't do. Now I have improved so vastly that little things I can't do well present problems. I'm looking for perfection regardless of my condition. Now I know I can do so much more. I wouldn't go near carpentry tools a year ago. Now I go near saws, etc. and expect perfection."

His final journal entry reads: "Anyone who has a problem like retinitis pigmentosa should use all the aids available as soon as he can. Admitting to yourself and to others that you can't see well is step one to an easier life. Bluffing through only adds to your problems."

SUBJECT #1


60
50
40
30
20
10
0
O & M CHECKLIST (NO. OF CRITICAL EVENTS)
5
4.5.
4
3:.5.
3
2.5
2
1.5
1
.5
0
O & M STRESS INVENTORY
PRE-TRAINING
30 PD.
1 PD.
PRISM OF CHOICE
-OBSERVED
-O&M Checklist
-SUBJECTIVE
-O&M Stress Inventory

Subject 2

Subject #2 is a 38 year old male who presented with a left homonymous hemianopsia with macular sparing. The subject is a divorced father with one child and is currently unemployed. He graduated from high school and developed special interest/skills in electronics. He stopped working as well as changed his living situation due to his vision impairment. He describes condition in the preface to his journal as follows:

"On 16 July 1977 and again on 14 September 1977 I underwent brain surgery for the removal of a large hematoma, and the repair of blood vessels (caused by a ruptured arterio-venous malformation) in the right parietal lobe of my brain. This left me with limited use of my left arm and leg, very little left side sensation, and no peripheral vision on my left side. I was told, at that time, that my vision loss was permanent and uncorrectable."

He came to the William Feinbloom Rehabilitation Center to explore the applicability of a new lens advertised in the media. Even though he had received rehabilitation services, he was unaware of low vision services which might assist him with mobility. Improved mobility was one of his main goals. He reported his three major mobility problems as follows:

1) Negotiating public transportation.
2) Knowing when another person is present.
3) Crossing intersections.

Summary of Pre-Training Structured Observations:

His clinical acuities were measured to be 20/600 O.D. and 20/300 O.S. unaided. His aided acuities were 20/20 O.D. and 20/25 O.S. His visual fields showed left homonymous hemianopsia with macular sparing. Functional fields were measured as follows: when he viewed straight ahead, a passerby on his right side was detected at 1 foot and on his left side at 13 feet. When viewing to the right the passerby was detected at 1/2 foot. When viewing to the left, the passerby was detected at 3 feet.

On his initial mobility evaluation he experienced 8 mobility problems centered around inefficient scanning, especially at intersections, bumping into people/objects and excessive slowing of pace in crowds. On the whole, he experienced relatively few observable problems, though he complained of fatigue and energy drain. His O&M Stress Inventory revealed a mean score of 2.5. His Personal Inventory score was 79 and his score on the Spielberg Anxiety Scale was 1.95.

Subject #2 was fitted with a base out 30 prism diopter lens O.S. Clinical acuities were 20/20 O.D. and 20/25 O.S. (unaided by prism) and 20/100 O.S. (aided by prism). His visual fields remained stable. Functional fields measured as follows: same results as above. However when viewing to the left, aided by prism, he detected a passerby at 2 feet.

Summary of Training Period I with 30 prism diopter lens

Subject #2 was provided with 15 hours of visual training in the use of a 30 prism diopter lens. He adapted quickly to the lens and demonstrated a noticeable improvement in scanning while using the prism. He was then sent home to wear the prism for one month and asked to keep a journal of occurrences during that period. After one month he returned to the clinic and his visual acuities were 20/20 O.D. and 20/20 O.S., unaided by prism. While viewing through the prism, his visual acuity was 20/100, O.S. His visual fields remained stable. His functional fields were measured as follows: when he viewed straight ahead, unaided a passerby on his right side was detected at 1/2 foot and on his left at 8 feet, representing a 5 foot improvement on his left side. When viewing to the right the passerby was detected directly beside him. When viewing to the left, through the prism, the passerby was detected at 1 foot, representing more improvement on his left side.

His mobility evaluation at this time revealed only one problem, an instance of excessive slowing of pace in crowds. Difficulty with scanning and bumping into people and objects was eliminated. It was evident that the subject's scanning and general pace improved. He walked comfortably and confidently and did not experience the fatigue he evidenced on his initial mobility evaluation. He demonstrated a decrease in stress level in mobility situations from 2.5 to 1.3. His anxiety level as measured by the Spielberg Anxiety Scale decreased from 1.95 to 1.75, and his Personal Inventory score improved from 79 to 83.

The subject's responses to using the 30 prism diopter lens were colorfully recorded in his journal as follows:

> "The lens is like a new toy. I keep staring through it at times ... it makes things seem closer to me and lower than they really are ... If I look through the lens and try to slowly touch an object I get it every time. Going slowly lets my hand and the object be in view at the same time, so it's easy to judge distances and hit the object."

> "If I turn my head slowly to the right, keeping my eyes pointed straight ahead until an object just comes into view in the lens, I can then scan to the left and see the object with my right eye. Glancing back and forth between these images I find that the lens' image is blurry and displaced to the right and downward. The amount of displacement increases with distance."

> "While watching the stage show I noticed (through the lens) someone standing beside me on my left side. It was a naked lady. She was about as anatomical as you can possibly get. Without the lens I would have missed half of the festivities."

Summary of Training Period #2 with 1 prism diopter lens (placebo)

The subject was fitted with a 1 prism diopter lens O.S. and wore it for a one month period. He was asked to compare this with the first prism and maintain his journal over the next month. Upon returning to the clinic his visual acuities were recorded at 20/20 O.D., and 20/30 O.S. He showed no change in acuity with the 1 prism diopter lens. His visual fields remained stable. Functional fields were recorded as follows: when viewing straight ahead, unaided by prism, a passerby on his right side was detected at 1 foot and on his left side at 13 feet (identical to his pre-training period). This represents a decrease in awareness from the 30 prism diopter lens wearing period. When viewing to the right, the passerby was detected at 1/2 foot. When viewing to the left, through the prism, the passerby was detected at 2 feet (a slight decrease from the 30 prism diopter lenses).

His mobility evaluation revealed an increase in problems to 5 recorded incidents. His pace in crowded areas was much slower and he re-experienced some bumping problems. In general however, as demonstrated in his initial evaluation, he is an independent traveler who experiences relatively few mobility problems.

He demonstrated an increase in self-perceived stress in mobility situations as evidenced in his mean O&M Stress Inventory score of 2.1 over 1.3 score recorded after his 30 prism diopter lens wear. His Spielberg anxiety scale score increased to 2.05, while his Personal Inventory score continued to reflect a positive trend from 83 to 86.

Subject #2 recognized the lack of help he received from the "new" lens. His first impression was that it wasn't doing anything. He stated that they provided no new information over what his plain glasses did. He is an intelligent individual who was quite perceptive about the changes he experienced with the 1 prism diopter lens. This is reflected in his journal notes: "I think the new type of lens is a placebo put into the research project for comparison purposes only. I'm looking forward to getting the first lens back in three weeks.

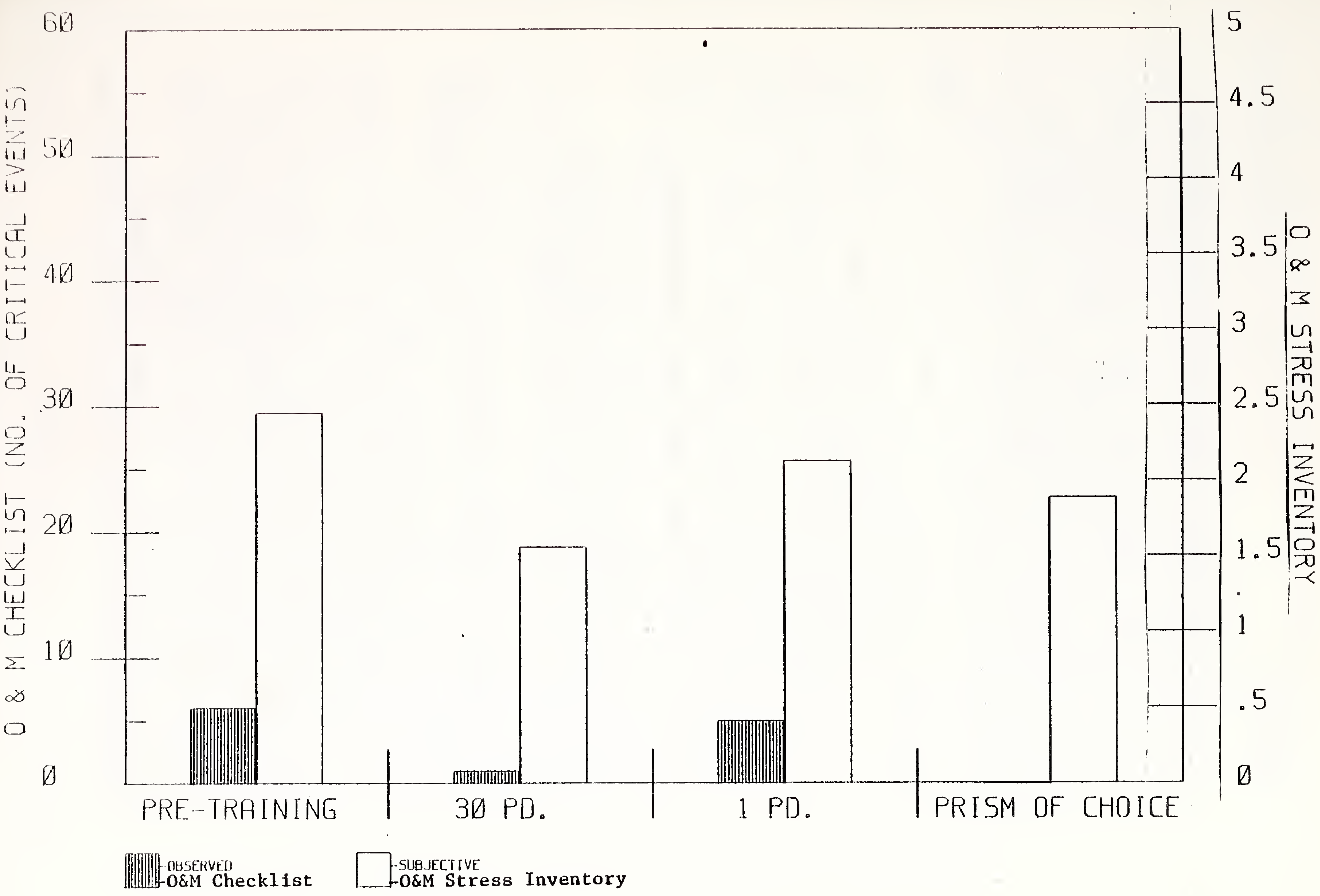
Final Evaluation with Prism of Choice

Subject #2 chose the 30 prism diopter lenses and said they won "hands down" over the second lens. He was concerned about "starting from scratch and getting used to it all over again." He adjusted immediately, however, and regained an improved performance in mobility. He experienced no mobility problems or incidents during his final mobility evaluation. His mean O&M Stress Inventory score was recorded at 2.0, approximately the same as the previous month's score but an improvement over his original score of 2.5. His Spielberg Anxiety scale score was 1.95, an improvement from his previous score of 2.05, but identical to his original pre-training score. His Personal Inventory score at 93 continued to register steady improvement.

His visual acuities were recorded at 20/20 O.D. and 20/25 O.S. Viewing through the 30 prism diopter lens his visual acuity was recorded at 20/100 O.S. Clinical measurements of visual fields indicated they continued to remain stable. His functional fields were recorded as follows: when he viewed straight ahead, unaided by prism, a passerby on his right side was detected immediately at his side, and on his left side the passerby was detected at 3 feet. When viewing to the right, a passerby was detected immediately at his side and when viewing to the left, through the prism, the passerby was detected at 1/2 foot. Compared to his initial response this represents an enhancement in visual field awareness both unaided and aided by the prism.

Subject #2 was most pleased with the results of the study. He felt he improved his visual efficiency and mobility performance and he plans to wear the prism on a full time basis. He ended his journal on the following comical note. "In the interest of steophonic hearing, I decided to take my glassess off when trying to trim the side of my beard.

SUBJECT #2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40
30
20
10
0
O & M CHECKLIST (NO. OF CRITICAL EVENTS)
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4
3.5
3
2.5
2
1.5
1
.5
0
O & M STRESS INVENTORY
PRE-TRAINING
30 PD.
1 PD.
PRISM OF CHOICE
OBSERVED
O&M Checklist
SUBJECTIVE
O&M Stress Inventory

Subject 3

Subject #3 is a 50 year old male who presented with a left homonymous hemianopsia and macular sparing resulting from a stroke in 1981. His recorded acuities were 20/20 O.D. and 20/25 O.S. In addition to vision loss, subject also complains of problems with his feet, which compound his present mobility difficulties. He experiences pain from excessive walking despite his orthopedic shoes. His previous employment included ownership of a gas station. He gave up employment as a result of his stroke and resulting vision loss,but prefers "working or doing something to staying home."

Subject #3 reported his three major mobility problems as follows:

1) "Bumping into people zipping right in front of me when I don't expect it."

2) "Tripping over things because of forgetting to look down."

3) "I'm afraid to cross streets."

Summary of Pre-Training Structured Observations

Clinical visual acuities were measured to be 20/30 O.D. and 20/60 O.S. unaided. With +0.75 spectacle correction O.U., his acuities were 20/20 O.D. and 20/25 O.S. He has only 30 degrees of remaining visual field in his upper right quadrants O.U.

Functional fields were measured as follows: while viewing straight ahead, unaided by prism, passerby was detected on his right side at 2 feet and on his left side at 20 feet. When viewing to the right, a passerby was detected at 1 foot. When viewing to the left, a passerby was detected at 5 feet.

On his initial mobility evaluation, he experienced 29 mobility problems, mostly centered around bumping into people and objects, depth perception, and traveling in crowded areas. His pace was slow, though this was more a result of his foot problems than his visual loss. Anytime he bumped into a pedestrian he was quite agitated about people walking across his path. He travels mostly in familiar areas and feels a decrease in independence in unfamiliar areas.

His O&M Stress Inventory revealed a mean score of 3.0. His Personal Inventory was 82 and his Spielberg Anxiety Score was 2.65.

Subject #3 was fitted with a base out 30 prism diopter lens temporally O.S. and a base in 30 prism diopter lens nasally O.D. His visual acuities were recorded at 20/80 O.U. with the 30 prism diopter lenses. Functional fields were measured as follows: while viewing straight ahead and to the right he detected a passerby at the distances recorded before. When viewing to the left, unaided, he detected a passerby at 5 feet and when aided by the 30 prism diopter lenses, he detected the passerby at 1 foot.

Summary of Training Period #1 with 30 prism diopter lens

Subject #3 was provided with 15 hours of visual and mobility training with the 30 prism diopter lenses. He reported images through the prism to be quite blurred. Within one lesson he appeared to have adjusted to the displacement factor created by viewing through the prism and, by the end of the training session, was using the prisms comfortably in a variety of environments. He returned after wearing the prisms for a one month period and his visual acuities were measured at 20/20 O.U. unaided by prism and 20/40 O.U. aided by 30 prism diopter lenses. His clinical visual fields remained the same.

His functional fields were measured as follows: when viewing straight ahead, unaided by prism, a passerby was detected on his right side at 2 feet and on his left side at 13 feet (a 7 foot improvement over his initial evaluation). When viewing to the left, unaided by prism, he detected a passerby at 5 feet and when aided by 30 diopter prism lens, the passerby was detected at 1 foot.

His mobility evaluation revealed 6 mobility problems, nearly a 5 times reduction in incidents still centered around bumping into people and objects and depth perception difficulties. His O&M Stress Inventory demonstrated a self-perceived reduction in stress, reflected in a 2.13 score as compared to a 3.0 original score. His Spielberg Anxiety score measured 2.05, which demonstrates a reduction in anxiety from his original score of 2.65. His Personal Inventory score was 77, 5 points lower than his original score of 82.

The following excerpts from his journal notes reflect some of his thoughts regarding his performance during the month of 30 prism diopter lens wear.

> "Went to the supermarket and used glasses. Didn't run into anything or anyone."
>
> "I had no problems in my doctor's office which is always crowded."
>
> "Coasted through store without bumping into anyone."

His depth perception problems are evidenced in the following excerpts.

> "I almost walked on a 3 year old who was crossing in front of me. I was not looking down."
>
> "I must keep looking down to keep from tripping on anyone or anything."

Subject #3 was then fitted with 1 prism diopter lenses which he was asked to wear for one month and compare with the first prisms.

Summary of Training Period #2 with 1 prism diopter lens (placebo)

Subject #3 returned to the clinic after one month of 1 prism diopter lens wear. His visual acuities were measured at 20/25 O.D. and 20/40 O.S. With 1 prism diopter lenses his acuities were 20/30 O.D. and 20/40 O.S. His clinical fields remained stable. Functional fields were recorded as follows: when viewing straight ahead, unaided by prism, a passerby was detected on his right side at 2 feet and on his left side at 12 feet. When viewing to the left, a passerby was detected at 2 feet, both aided and unaided by the 1 prism diopter lens.

His mobility evaluation reflected an increased in problems from 6 to 12 especially related to bumping into people and maneuvering in crowds. Despite this, he demonstrated his lowest score, 1.47, in self-perceived stress related to O&M situations. He felt the "new" lenses did not help him much and found them to be a nuisance. This attitute is evidenced in the following excerpts from his journal:

> "They don't give me the same results as the first prisms. They don't throw the same view."
> "They're not doing the job as the first pair did. The New lenses are so poor, they're annoying to wear".
> "With the first glasses, I was able to see my wife when we went out. But the new lenses don't

> show me her face at all, only if I turn my head toward her."

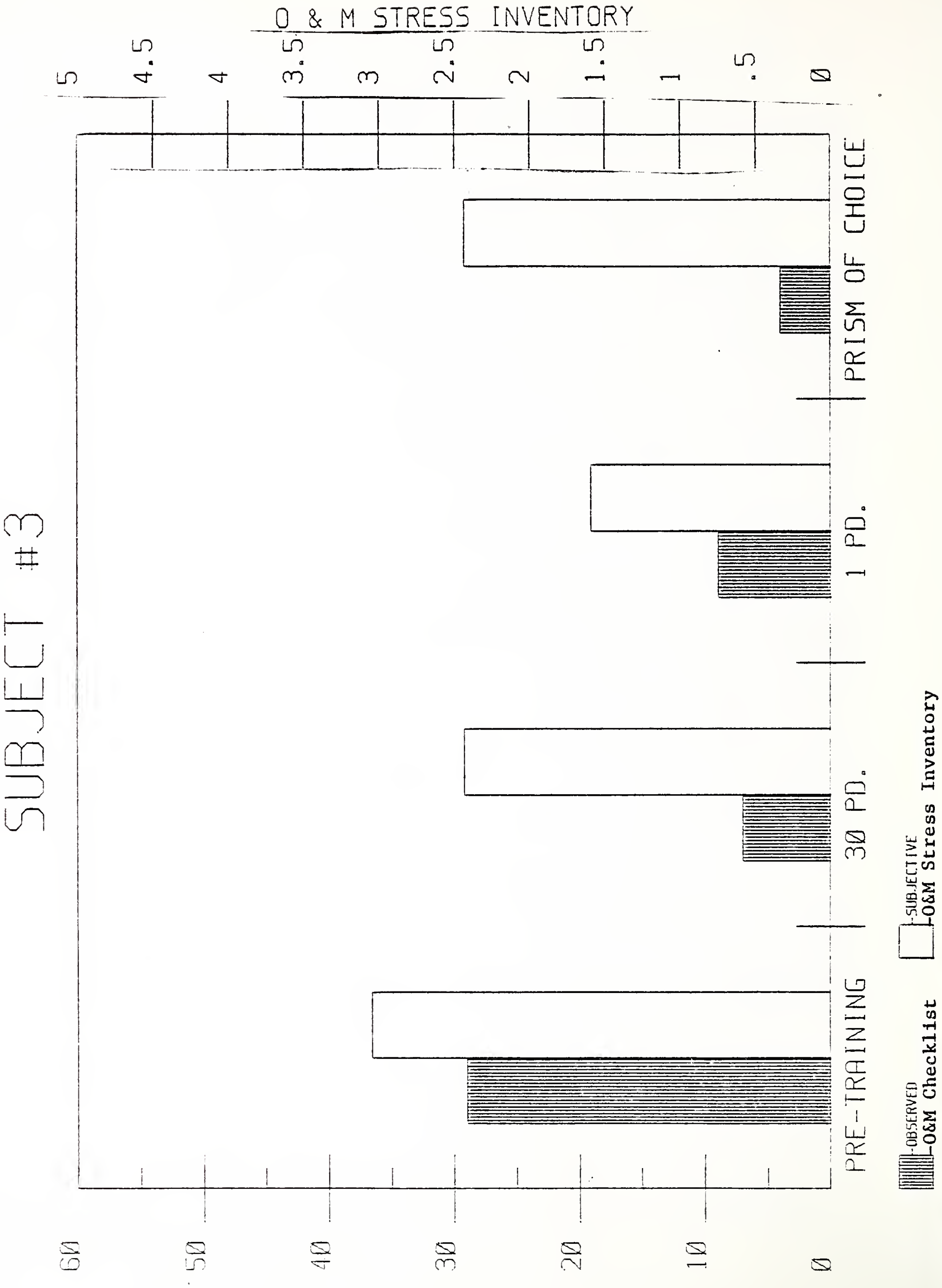
Subject #3 continued to reflect a negative trend on his Personal Inventory score with a drop in score from 77 to 69.

Final Evaluation with Prism of Choice

Subject #3 chose the 30 prism diopter lenses and wore them for an additional month before returning for his final visit. At that time his visual acuities were recorded at 20/25 O.U. aided by 30 prism diopter lenses. His clinical visual fields remained stable, though his functional fields demonstrated a continued increase over his original measurements. Viewing straight ahead, unaided by prism he increased his original awareness of a passerby on his left side by 9 feet, from a 20 to 11 feet detection rate. Viewing to the right, he remained stable in detecting a passerby at 2 feet. With the 30 prism diopter lenses, he was able to detect a passerby on his left side by 2 feet, as compared to his originally unaided vision, which detected a passerby at 5 feet.

His final mobility evaluation reflected a steady decrease in problems from an original rate of 29 incidents to a final of only 4 incidents with the 30 prism diopter lenses. His O&M Stress Inventory score 2.10, registered an increase from the previous month, but a decrease in stress from his original score of 3.0. His Personal Inventory score 79, raised 10 points from last month's score of 69, but reflected a 3 point negative trend from his original score of 82. His final Spielberg anxiety score of 2.40 represented a positive trend or decrease in anxiety as measured in his original score of 2.65.

Subject #3's final comments about the prisms were that they didn't help at night or assist him with his depth perception problems. He felt there were more positive than negative factors and intends to continue wearing the prisms because of his increased visual awareness and assistance in mobility situations.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4.5
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3.5
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2.5
2
1.5
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0
PRE-TRAINING
30 PD.
1 PD.
PRISM OF CHOICE
60
50
40
30
20
10
0
O & M CHECKLIST (NO. OF CRITICAL EVENTS)
-OBSERVED
O&M Checklist
-SUBJECTIVE
O&M Stress Inventory

Subject 4

This subject, a 39 year old male, presented with a history of brain tumor and hydrocephalus in the area of the pituitary gland. This had been diagnosed and treated through surgical and radiation therapy in 1953, when he was 10 years old. He was left with only light perception in his left eye and 20/50 visual acuity in the right eye with spectacle correction. A 10 degree visual field remained in the right eye. He experienced no other major health problems. He was unemployed at the time he participated in the study. He was a client of the state rehabilitation agency for the visually impaired. He had previous mobility training and was a proficient traveler with a long cane. He had used a guide dog at one time but had to give him up due to a prolonged illness during which time the dog was inactive. He was very comfortable traveling in most areas. He lived alone and was seeking employment.

He reported his three most significant mobility problems to be:

1) Traveling at night
2) Unfamiliar intersections
   -not knowing if cars will turn right on red
   -not knowing how it is shaped--where signs are, etc.
3) High noise
   -not knowing how to interpret it
   -totally distracting noises--(i.e., air hammers)

Summary of Pre-Training Structured Observations

Clinical acuities were recorded to be 20/70 O.D. with a -.75 sphere correction and light perception O.S. Visual field was measured to be 10 degrees centrally with no islands of vision. During the first mobility evaluation he was observed to have 35 mobility problems, most of which centered around missing landmarks, items in a store and extreme fear of raised platforms, particularly subway platforms. He would frequently "hug" walls. His initial score on the O&M Stress Inventory was 3.13. His initial score on the Spielberg anxiety scale was 2.5 and his Personal Inventory was 73. Functional visual field yielded detection of passerby on the right at 5 feet when viewing straight ahead. The passerby was detected at 10 feet on the left side. When viewing to the right, the passerby was detected at 2 feet. When viewing to the left, with his right eye, the passerby was detected at 3 feet.

The subject was noted to walk very fast and bump into objects at fairly high rates of speed. His contacts with objects caused physical discomfort. He explained he'd learned this fast pace when walking with a guide dog. He proved to use smooth and efficient cane skills and moved with ease in all areas of travel except one, subways. When informed that we would be taking the subway, he literaly broke into a cold sweat. He refused to go at first, then agreed if the instructor would lead him sighted guide. As the station was approached he became increasingly nervous. His breathing quickened, he began sweating profusely and his grip on the instructor's arm tightened so much as to be painful. It was revealed then that it was the high platform and steep drop-offs to the train tracks that caused him such concern. It was discovered in later training that any wide open area with a drop-off of over a foot caused him equal fear and high anxiety.

His visual scanning behaviors were observed by the instructor and reported by the subject himself to be almost non-existent. His general position of gaze was straight ahead. If scanning was done at all, it was done with complete head movement and sometimes body turns.

After initial mobility evaluation he was fit with two 30 prism diopter lenses on the right eye--one placed temporally and one nasally. The prisms were placed on his conventional spectacle distance correction. Clinical acuities went from 20/70 without the prism to 20/100 viewing through the prism. Functional visual fields changed as follows: detection of passerby on right or left while viewing straight did not change. Detection of passerby on right when viewing right changed from 2 feet to 1 foot; on left side when viewing left (with right eye) from 3 feet to 2 feet.

Subject was then given 15 hours of visual and mobility instruction in the use of the prism.

Summary of Training Period #1 with 30 prism diopter lens

Subject made excellent progress with use of the prisms. He adapted almost immediately to the horizontal displacement caused by the prism. However since his scanning behavior was so poorly developed in all directions he had problems initially locating objects when they were placed higher or lower than eye level. Due to the very small area his visual field covered, vertical scanning was just as important as horizontal scanning. It was discovered at this point in the training that his visual tracking abilities were also rather poor. With practice, this skill improved also. One activity particularly successful with this subject was to present colored lights and objects in various positions in front of him and have him scan in a systematic fashion to locate them and touch them as quickly as possible. The lights and objects were brought from behind and hung on strings so as not to provide "clues" as to their location. These exercises were performed without the prism. Once tracking and scanning skills improved, the prism was reintroduced with speedy progress from this point on. No "lags" in skills were noted after this initial period of training in basic visual skills. Indoors, subject was noted to be able to locate office doors, seats in the waiting area, water fountains, etc. much more easily. Outdoors, obstacles such as modern, suspended, phone booths that are sometimes not detected by a cane, opening doors, fast-moving pedestrians, tree branches, etc. were avoided more quickly and easily. He commented numerous times how much more he could see now. Glare proved to be a significant problem for him, but he reported that even the lightest tint of absorptive sunlenses cut down too much light. A sun visor was attached to his frames and this provided much more comfort from the glare.

At the end of this training period Subject 4 was noted to have 13 mobility problems (compared to the inital 35), 9 of which related to fear of high raised platforms. The others related to his difficulty in scanning resulting in missing items in stores. The O&M Stress Inventory showed a lower stress rate of 2.4 rather than 3.1 initially. The Spielberg anxiety scale also showed a lower overall anxiety rating of 1.9 versus 2.5 initially. The score on the Personal Inventory was approximately the same-71 as opposed to 73 initially.

Subject 4 was then sent home for a month, instructed to wear the prisms and keep a journal of his experiences about the prisms.

Summary of Training Period #2 with 1 prism diopter lens (Placebo)

The subject was fit with 1 prism diopter lenses. Clinical acuities and fields were redone. Acuities were 20/70 with and without the prism. Functional fields were as follows: without prism, viewing straight, passerby was detected at 4 feet on right side, 1 foot on left side, 2 feet right side and 3 feet left side when viewing to those respective sides with the right eye. No differences were noted with the 1 prism diopter lenses. Subject 4 noted the difference himself immediately and asked if his was a "placebo or something." He was told that it was just the second prism and that he was to make the same observations of this prism as he had with the first. Although he was not pleased with this prism, he reluctantly agreed to continue with the study and maintain his journal.

At the end of this period Subject 4 was noted to have 20 mobility problems with this prism (compared to 13 with the 30 prism diopter lenses). Once again most of the problems centered around fear of high, raised platforms, bumping into people and missing items in stores. His O&M Stress Inventory Score increased to 2.51 from the previous 2.43. Spielberg's anxiety scale measured 2.2, up from 1.9 (with 30 prism diopter lenses). The Personal Inventory score reflected a negative trend down to 65 from the previous score of 71.

It is noteworthy that Subject 4 moved his place of residence during this time to a completely unfamiliar area.

He was then told to take the prism of his choice and wear it for a month and keep his journal. He chose the 30 prism diopter lenses.

Summary of Final Evaluation with Prism of Choice--30 prism diopter lens

Subject 4 experienced 10 mobility problems at the end of this period, nine of which related, once again, to his apparent phobia of high raised platforms. the tenth was tripping over something he missed with his cane.

Clinical acuities without the prism were 20/70 O.D. and light perception O.S. When viewing through the 30 prism diopter lenses his visual acuities were 20/100 O.D. and light perception O.S. Clinical visual fields remained constant at 10 degrees. Functional fields were recorded as follows: without the prism, viewing straight, detection of passerby was made at 4 feet on the right and 10 feet on the left. With the prism, detection was made at 3 feet on the right and 1 and 1/2 feet on the left viewing in those respective directions. Viewing through the 30 prism diopter lenses, detection was made at 2 feet on the right and 1 foot on the left, viewing those respective directions. The O&M Stress Inventory score was 2.29, the lowest since he'd begun the study. His overall measure of anxiety was 2.20 compared with the initial score of 2.50. His Personal Inventory score was 69, though it was higher than the 65 score with the 1 prism diopter lens, it reflected a lower score than his initial rating of 73.

He reported feelings of loneliness since he began living in a new area. Even though he was pleased with his increased visual awareness and mobility skills, his conversations and final comments centered around his loneliness in his new living situation.

Discussion:

It appears that Subject 4 benefitted from training in visual skills as well as from the 30 prism diopter lenses. His mobility problems with the 1 prism diopter lenses, although higher than with the 30 prism diopter lenses, were still lower than his pre-training period.

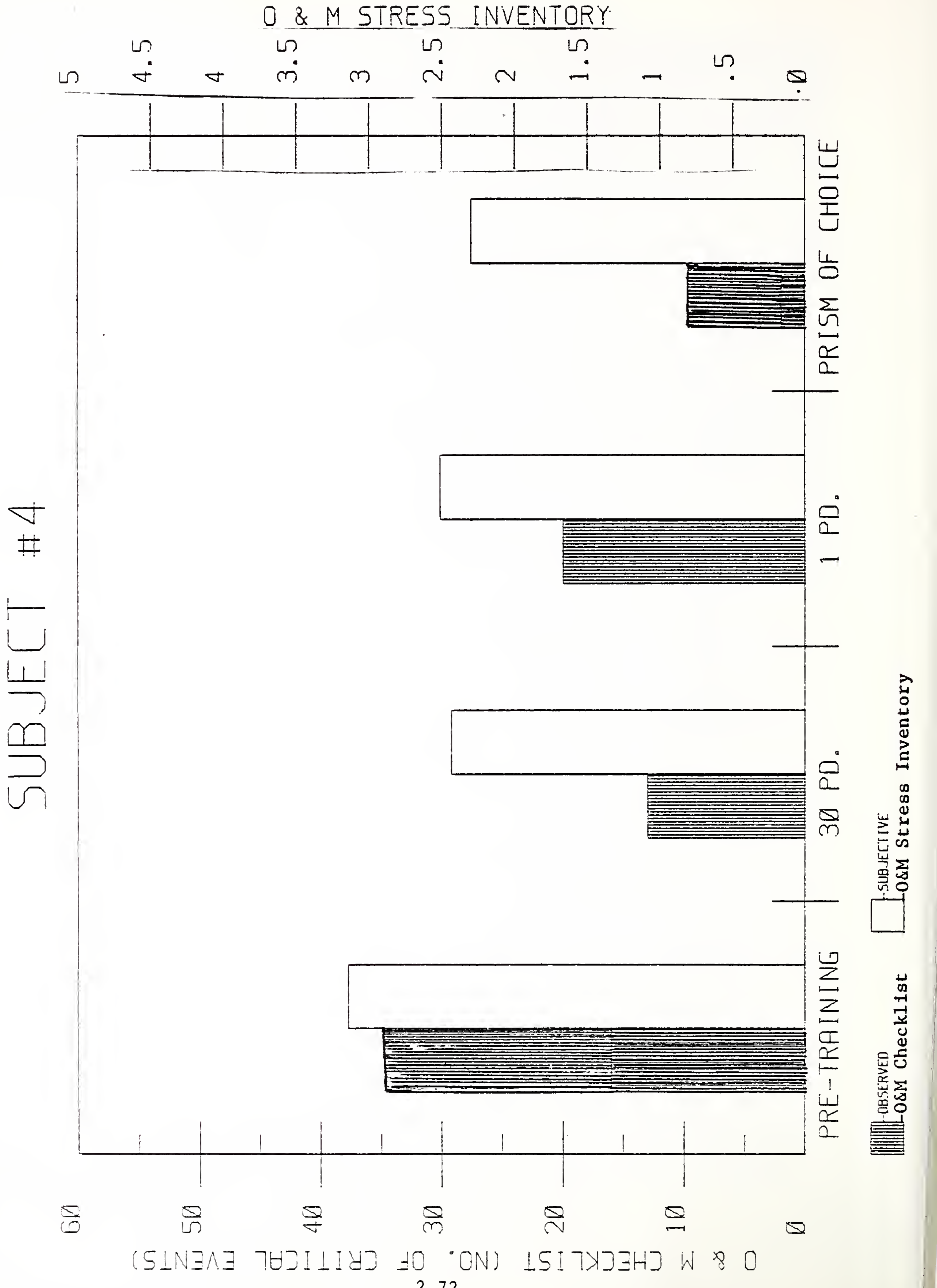
In his journal he noted the advantages with the 30 prism diopter lenses as reflected in the following excerpts:

1) "Very useful at dinner table spotting items at close view."
2) "Avoided bumping person I would have bumped before"
3) "Good adjustment in travel situations"-(23 notations to this effect)
4) "Much easier to travel in crowded areas"
5) "Easy to adapt to displcement. The benefits outweigh the displacement factor."

Disadvantages were:

1) "Fogs up in the rain."
2) "Glare bleaches things out"
3) "Frames slipping due to perspiration caused unexpected displacement" (remediated later by head straps)
4) "Derogatory remarks by public--didn't understand why I was wearing glasses and using a cane."

The only problem not signficantly touched on by training was the phobia of raised platforms. Counseling in combination with continued mobility instruction was recommended.


SUBJECT #4
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O & M CHECKLIST (NO. OF CRITICAL EVENTS)
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PRE-TRAINING
30 PD.
1 PD.
PRISM OF CHOICE
OBSERVED O&M Checklist
SUBJECTIVE O&M Stress Inventory

Subject 5

Subject #5 is a 41 year old male who presented with a left homonymous hemianopsia, with remaining vision in the lower right quadrant. Vision loss resulted from surgical and radiation treatment for a brain tumor. His visual acuity was reported to be 20/40 right eye and 20/30 left eye.

He experienced other health problems relating to the brain tumor. He was on medication to prevent seizures and periodically experienced loss of equilibrium and short-term memory problems. The subject was unemployed during his participation in the research project. His daily activities involved housekeeping duties. He reported he "wasn't allowed" to go out by himself. He felt his family was more concerned about his mobility than he was. Although he didn't rely on sighted guide, he never went out alone and he did have access to public transportation in his home area.

The three most significant mobility problems he reported were:

1) Glare
2) Bumping people on his left side
3) Missing drop offs and stepping off curbs

Summary of Pre-Training Structured Observations

Clinical acuities were measured to be 20/40 O.U. His clinical field was plotted to be a 20 degree wedge O.U. in the lower right quadrant.

Functionally his right field of view was determined to be more effective than had been clinically measured. He was able to detect objects in his upper field of view, which, according to his clinical field, should have been impossible.

Functional fields were measured as follows: a passerby was detected at 9 feet, when viewing straight ahead. When viewing to the left a passerby was detected at 3.5 feet. When viewing to the right a passerby was detected when standing even with the subject.

On initial mobility evaluation he experienced 26 mobility problems. The majority of these problems involved missing and/or bumping into objects, people, visual landmarks, items in store on his left side. His subjective feelings of stress in mobility situations, as measured by the O&M Stress Inventory, revealed a mean of 2.5. His Personal Inventory score was 85 and his Spielberg anxiety measure was 2.9.

Although he said that not being aware of people on his left side was not that much of a problem for him, he consistently missed people who walked up to him on his "blind" side. It appeared to be a case, literally, of him not knowing what he was actually missing. He also reported that social gatherings and crowded areas were not a problem for him. However, it was determined that these were not a problem because:

1) He rarely attended these functions.
2) When he did, his wife guided him through them.

Visual scanning was only done occasionally by moving his head and sometimes his whole body. He wore sunglasses at all times outdoors. His general orientation and movement skills were not a problem. However, he simply "missed" a great deal on the left side. He had no problems in crossing streets safely, turning his whole body to check to see if his path was clear.

The subject was fit with a 30 prism diopter base out lens on the temporal side of his left eye. No lens was used on the right eye. His acuity went from 20/50 without the prism to 20/50-2 with the 30 prism diopter lens. His functional fields of view showed detection of a passerby at 9 feet, when viewing straight ahead. He increased his detection of a passerby from 4 feet, unaided by prism, to 1 foot, aided by a 30 prism diopter lens when viewing to the left.

Summary of Training Period #1 with 30 prism diopter lens

At the end of the 15 hour training period Subject 5 had only 2 mobility problems compared with 26 when he started in the program. His peripheral awareness, even when not wearing the prism increased. His functional field of view improved. Initial detection of a passerby, when gazing straight ahead, had been recorded at 9 feet. At this time it was measured to be 6 feet. Clinical acuities and fields remained the same. His O&M Stress Inventory score decreased from 2.5 to 1.9. However, his score on the Spielberg Anxiety Scale increased to 3.05 from 2.9. His score on the Personal Inventory was essentially the same at 83.

Initially, he adapted quite easily to prism training in static situations. However, when movement activities were incorporated, he began to have significant problems. He needed constant reinforcement and feedback to keep his head and eyes in their most appropriate and beneficial position for prism wearing. He tended to walk sideways, turning his whole body, not just his head. However, with almost constant feedback from the instructor, he began to scan more efficiently. This occurred after 8 hours of instruction. Due to previous brain surgery, he had a mild short-term memory problem and therefore needed constant reminders. He sometimes forgot that the purpose of the prism was not to make things clearer in the periphery--rather to increase his peripheral awareness. When aware of objects in his peripheral field, he was instructed that he should then turn his head to view it through his clear functioning central (non-prismed) vision. As he noted in his journal, this principle was not fully learned until near the completion of his participation in the project. Once he passed the initial adjustment hurdle he did quite well during the remainder of this training segment. He did report double vision through the prism at this point. A slight cutback of the prism alleviated the double image. Activities were gradually made more difficult and complex (See training protocol Appendix C6). Each time a new situation was introduced, such as walking with the prism, touching things while looking through the prism, walking outdoors, walking in narrow spaces, shopping malls, crowded areas, etc, he needed continuous feedback concerning visual scanning patterns and head movements. However, as the training progressed, each new situation required fewer reminders from the instructor.

At the completion of 15 hours of training he was sent home to wear the prism for a month and keep a journal of his experiences. Absorptive sunlenses were also dispensed at this time to alleviate the glare which he complained was worse while wearing prism #1.

Summary of Training Period #2 - 1 prism diopter lens - Placebo

Upon returning from a month's wearing period with the 30 prism diopter lens, the subject was fit with a 1 prism diopter lens, referred to as "Prism #2". Acuities were the same with and without the 1 prism diopter lens. Clinical fields also remained the same.

Functional fields remained improved. Even without the prism his functional field of view while viewing straight ahead, improved as demonstrated by his ability to detect a passerby at 6 feet, compared to 9 feet when he began the project. Initially when viewing to the left without the prism, he had detected a passerby at 4 feet. He was now able to do the same at 2 feet. There was no difference with the 1 prism diopter lens. Not only was he becoming a BeTter "flicker" (his term for scanning in his journal) but he was better able to interpret visual phenomena in his peripheral field of view.

At the end of a month's wearing period with this 1 prism diopter lens, he once again, experienced only two mobility problems; bumping 2 people in a very crowded area. His O&M Stress Inventory decreased slightly to a mean score of 1.8. His Spielberg anxiety score increased from 3.05 to 3.2 and his Personal Inventory score increased slightly from 83 to 85.

At this time he reported that he preferred the 1 prism diopter lens due to its clarity. He had observed no great difference functionally, in the field of view with the 30 prism diopter lens or the 1 prism diopter lens. He continued to comment that he "flicked" (visually scanned) a lot more than he had before. He was then instructed to take the prism of his choice and wear it for a month. He chose to wear the 1 prism diopter lens.

Summary of Final Evaluation with Prism of Choice

This subject during his final mobility evaluation, after one month of wear, experienced only one mobility problem (missing awareness of someone standing next to him) as compared with 26 at his original evaluation. Regarding his functional field of view, he first detected a passerby at 9 feet while viewing straight ahead. Now, however, he continued to detect the passerby sooner at 6 feet. While viewing to the left, though the 1 prism diopter lens, he improved his awareness of a passerby from 4 feet to 2 feet. His O&M Stress Inventory score was reduced to 1.9 from an original 2.5. His Spielberg anxiety score increased however, from an initial 2.85 to a final 3.0. His Personal Inventory score increased slightly from an initial 85 to a final 87. His clinical acuities and fields were unchanged.

Discussion

It appears obvious in this particular case that the prism was an excellent tool for teaching more efficient and more frequent visual scanning behaviors. The main advantages of the 30 prism diopter lens he noted in his journal were:

1) "Purposely increased eye movements toward area

of field defect, even when not wearing prism."

2) "Training helped to condition eyes to move to left."

3) "Good training tool for teaching eye movement."

The main disadvantages with the 30 prism diopter lens were

1) "glare"

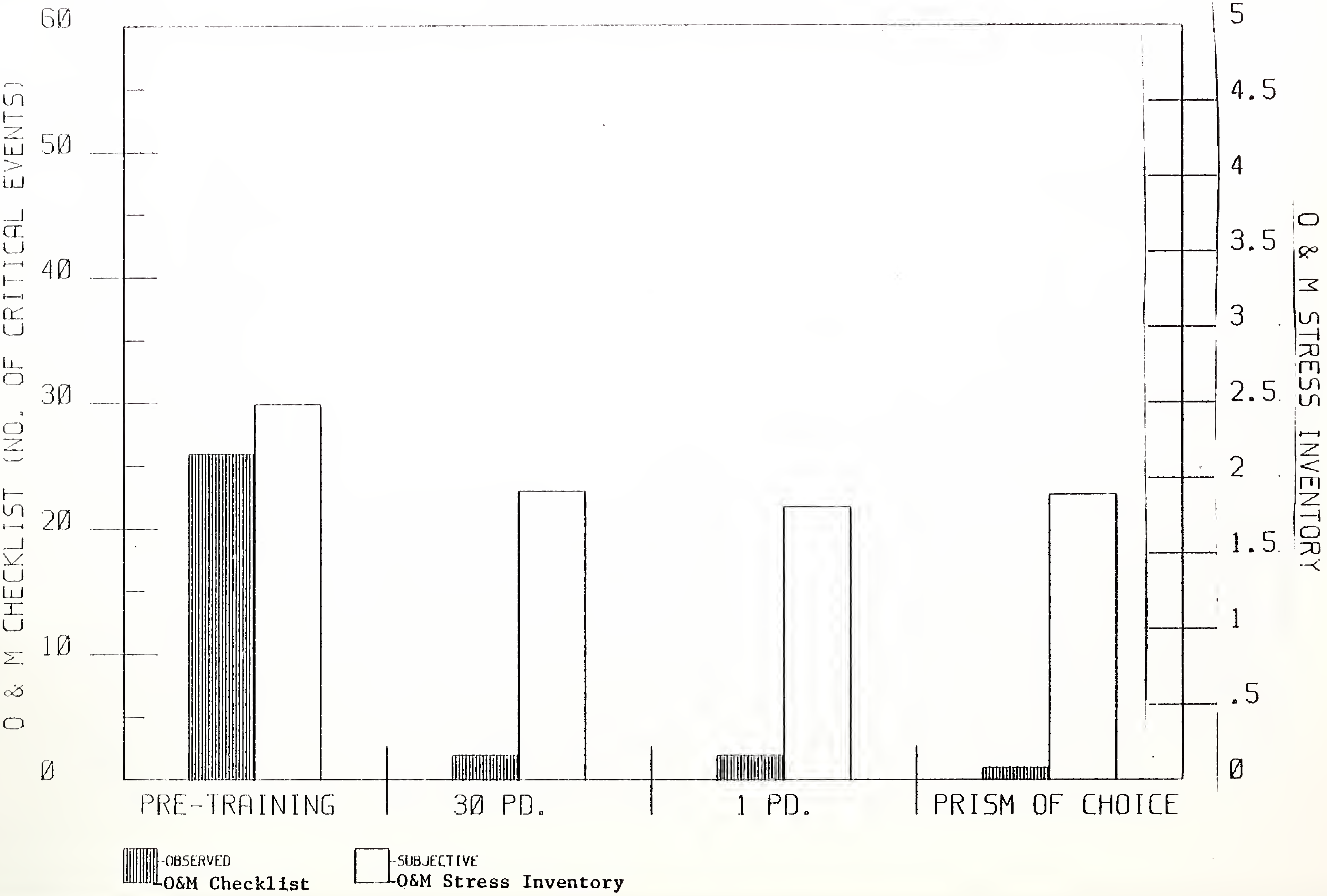
2) "problems in heavy rain fogged up"

3) "cuts down on vision"

It is also interesting to note the increase in the functionally measure peripheral field compared to the static periperhal field measured clinically. It is suggested here that even a 20 millimeter white wand is still not a large enough target to simulate "real-life" mobility situations requiring use of peripheral field for detecting a wide variety of types, colors and sizes of objects.

A follow-up study would be interesting to determine if, with continued increased scanning, measures of clinical fields would demonstrate an increase, as had the functional fields. Unfortunately this is not possible with this subject. Several months after completing the project, he had a grand mal seizure, fell and injured his head severely. He is now in a nursing home, completely helpless. The last entry he made in his journal seems quite appropriate to include here. It is his way of saying thanks. "I hope that the opinions of mine will help in future cases and most of all I'd like it known that without the dedicated and unselfish people who helped me it would all be a FLOP! Thank you all! Including the Grantor of this Program!"

SUBJECT #5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O & M STRESS INVENTORY
PRE-TRAINING
30 PD.
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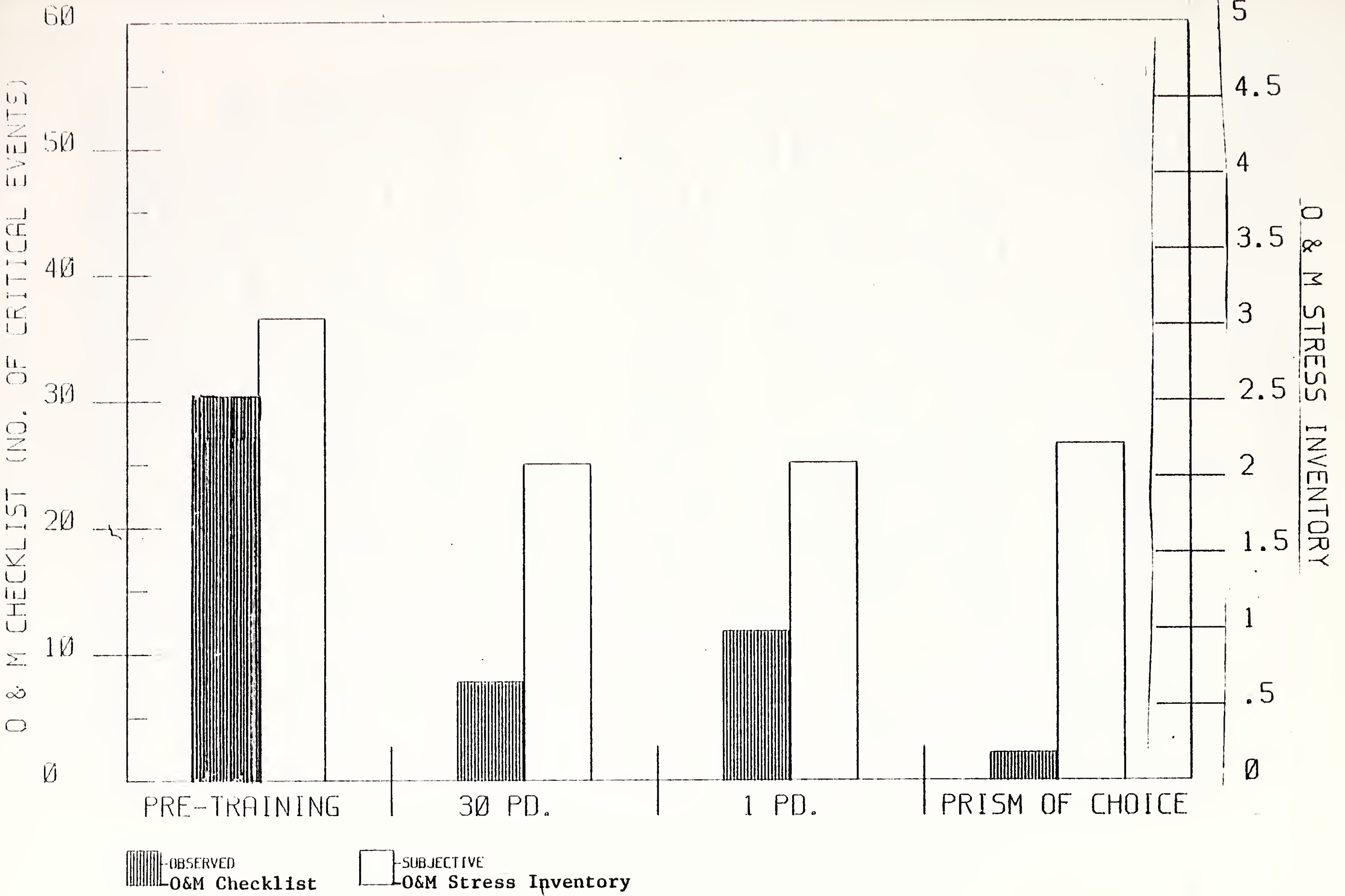
PRISM OF CHOICE
-OBSERVED
O&M Checklist
-SUBJECTIVE
O&M Stress Inventory

MEAN SCORES (N=5)*



* Subjects who completed all phases of prism training and are currently wearing prisms

Subject 6

Subject 6 is a 54 year old male with severely constricted fields resulting from a cardio-vascular accident following open heart surgery 2 years prior to this contact. No visual field remains on his left side and approximately 5-7 central degrees are present on his right side. Acuities are measured to be 20/20 O.U. with a spectacle correction of:

OD-0.25 - 0.25 x 80/1.25
OS-1.00 DS /1.25

Other physical problems exist: the subject has a plastic valve in his heart, is taking several medications, tires very quickly, and experiences dizziness periodically. He is under constant supervision by a cardiologist. He was still on leave of absence from his job as a school teacher at the time he participated in the study. His main activities involved keeping up with his large colonial house on 2 acres, refurbishing antiques and caring for his cats. He is able to perform cooking and cleaning chores around the house, though it takes him longer than it used to.

He had thus far not received any previous rehabilitation training. His state rehabilitation agency for the visually impaired referred him for a low vision evaluation which is where we made contact with him. He reported his three main mobility problems to be:

1) "Bumping things/people"

2) "Something/someone bumping me"

3) "Fear that I won't be able to do what I set out to do, and thereby become demoralized."

Summary of Pre-Training Structured Observations

Clinical acuities measured to be 20/20 O.U. with his spectacle correction. Clinical visual fields were recorded to be about 5 degreees in the right side of the macular area. Functional fields were recorded as follows: looking straight ahead a passerby was detected on the right at 15 feet and on the left at 15 feet. When looking right, detection was made at 3 feet, and when looking left detection was made at 4 feet. On his initial O&M evaluation he experienced 41 mobility problems, most of which centered around missing landmarks, drop-offs and curbs, tripping on low-lying objects and shuffling of feet. His initial

O&M Stress Inventory score was 4.24 indicating a high level of stress related to mobility situations. His Spielberg anxiety score was 2.65. His Personal Inventory score was 61.

He was noted to be extremely cautious and unsure of himself. His observable scanning behaviors were totally non-existent. He occasionally quite cautiously, turned his entire body to look for things and turned his head somewhat to scan. He was able to cross busy streets, however he was very uncomfortable doing this. Turning cars were his biggest fear. It was during this experience that he decided a cane would be advantageous, so that motorists could see that he had a vision problem and would "steer clear" so to speak. When asked to visual scan for landmarks to find his way back to the departure point, the instructor was afraid he would have a heart attack (literally). The reaction was severe, he physically backed away and began stammering "There's no way I can possibly do that, much less find my way back to the car by myself! Why that's just impossible! I would never atttempt to do that sort of thing by myself! I have absolutely no idea where I am. This is completely demoralizing!" When asked how he located places in other areas he reported that he walks about 3 feet behind his companion on his right side and glues his eyes on that person so he doesn't lose them. His companion leads him to the places he needs to go. Independent mobility had been completely inconceivable to him, prior to participating in this study.

He was then fit with two 30 prism diopter lenses - one temporally on the left eye and one nasally on the right eye. The prisms were placed on his conventional distance correction glasses. The +1.25 bifocal did not interfere. Clinical acuities were significantly different. They went from 20/20 without the prism to 20/100 when viewing through the 30 prism diopter lenses. Functional field of view was measured as follows: a passerby was detected at 20 feet on the left and at 12 feet on the right when viewing straight ahead. A passerby was detected on the left at 2 feet and on the right at 1 1/2 feet when viewing to the side, through the prisms.

Summary of Training Period 1 with 30 prism diopter lens

Before prism training was initiated, some basic cane skills were introduced. Simple indoor touch technique was taught for four hours. He mastered the basic technique with no problem. Unfortunately, though, there was not time in the project for more in-depth training for perfection of his techniques and gaining more trust in the information gathered through the cane.

He immediately noticed the "jump" of images when prism training began. He progressed at a fairly steady pace working in a static position. He taught himself little tricks such as moving his hand into the area of prism before touching something that was already in the prism viewing area. Major problems occurred when independent mobility was attempted while wearing the prisms. Constant reminders were required to keep his head straight and move his eye into the prism area. Even though he was able to do the required tasks this proved to be extremely fatiguing, and the session was ended early. The instructor was quite concerned about the severity of his fatigue and depressed mood at the end of this session.

At the next session, he expressed his alarm at the severity of his fatigue from the previous lesson. He realized that it stemmed more from depression rather than physical exertion. Interestingly, the depression occurred from the constant reminders about his eye movements. The subject proceeded to report a strange life long "repulsion", even before the vision loss. He stated that he has always had a strong aversion to consciously moving his eyes. "Even as a college student, if I noticed my eyes scanning across the page while reading, I'd slam the book shut, completely repulsed." The reminders were more easily processed and accepted by changing the wording from "move your eyes to the left" to "look to the left" or "be aware of your left side". It was also beneficial for the subject as he stated to "get it off my chest". Afterwards, consistent progress was made in adapting to the prisms.

At the end of this training period Subject #6 experienced only 4 mobility problems compared to 41 prior to training. His O&M Stress Inventory went down from 4.24 to 4.19. His report of overall anxiety (Speilberg) went up from 2.65 to 2.85 and his Personal Inventory increased significantly from 61 to 72.

At the end of this training period he was able to independently find a shop in a large mall and relocate his original point of departure. This was a major accomplishment for him, considering his previous behavior of "tail-gating" his companion. He was quite pleased with his progress in mobility.

He was then sent home for a month, instructed to wear the prisms and keep a journal of his experiences.

Summary of Training Period #2 with 1 Prism Diopter lens (Placebo)

Subject #6 was fit with a 1 prism diopter lens. Clinical acuities and fields were re-done. Acuities were 20/20 O.U. without the prism and 20/30+ O.U. looking through the 1 prism diopter lenses. Functional fields were as follows: without prism, viewing straight ahead, a passerby was detected on the left side at 20 feet and on right side at 6 feet. This represents a significant change on the right from 15 feet recorded the first time. Without prism, viewing to right, a passerby was detected at 3 feet. Without prism viewing left, a passerby was detected at 4 feet. This functional fields were identical with the 1 prism diopter lens.

Subject #6 was not sure of his observations, initially, but felt that they didn't distort things as much as the first pair of lenses had. Things appeared much clearer to him through these prisms than through the first ones he wore.

As noted in his journal during his wearing time with this prism, he discovered through trial and error comparison that the prism was, in effect, doing nothing to enhance his field. However, he noted that "it was much less disorienting emotionally than had been the confusion with the first one."

Although his field of view was not enhanced, the prism made his vision problem visible, and his need for assistance in public more credible.

At the end of this period Subject #6 was observed to have 6 mobility problems with the 1 prism diopter lens compared to 41 initially, and 4 problems with the 30 prism diopter lens. His O&M Stress Inventory score increased to 4.35, which was the highest stress level in relationship to mobility he experienced in the entire study. His overall anxiety score, 2.68, was lower than his score with the 30 prism diopter lens, 2.85, and was slightly higher than his original score of 2.65. His Personal Inventory score was 72, similar to his score of 73 with the 30 prism diopter lens, and more than his original score of 61.

Subject #6 was then requested to take the prism of his choice and wear it for a month. He said, if he had to choose one it would be the 1 prism diopter lens, because it was not disorienting, yet did assist him in dealing with the public and alleviating some of his embarrassment concerning his vision problem.

However, he only agreed to wear the lens when he went out in public, which was very seldom. He declined to wear it for the next month, and did not wish to continue with the research study protocol.

Discussion

By comparing the 41 mobility problems Subject #6 experienced prior to training with the 6 mobility problems he experienced at the completion of this study, it is evident that he benefited from the visual and mobility training with the prisms. His Personal Inventory score, or measure of overall well-being, increased during the study. This is reflected in what he pointed out numerous times: "I finally feel like I can talk about this. It's such a battle you know. It makes it easier to deal with knowing I'm not by myself." The fact that his overall anxiety and mobility stress levels remained high could be explained by his statement that he "began to expect much more of myself in mobility situations," without having a complete O&M training program. He was referred for continued mobility instruction at completion of this study.

It is also suggested that he needed longer than 15 hours to completely adapt his visual scanning behaviors due to his previous "aversion" to conscious awareness of eye movements.

In his journal Subject #6 noted the only advantage of both the 30 and 1 prism diopter lens was that "They helped identify me as a visually impaired person. I felt it was easier to explain problems I had when they saw the glasses."

He noted numerous disadvantages, many of which indicate lack of proper visual scanning behaviors necessary to benefit from the prism. Scanning, continued to remain a problem for him throughout the study. He cited many more disadvantages, especially regarding the 30 prism diopter lens as written in his journal they were as follows:

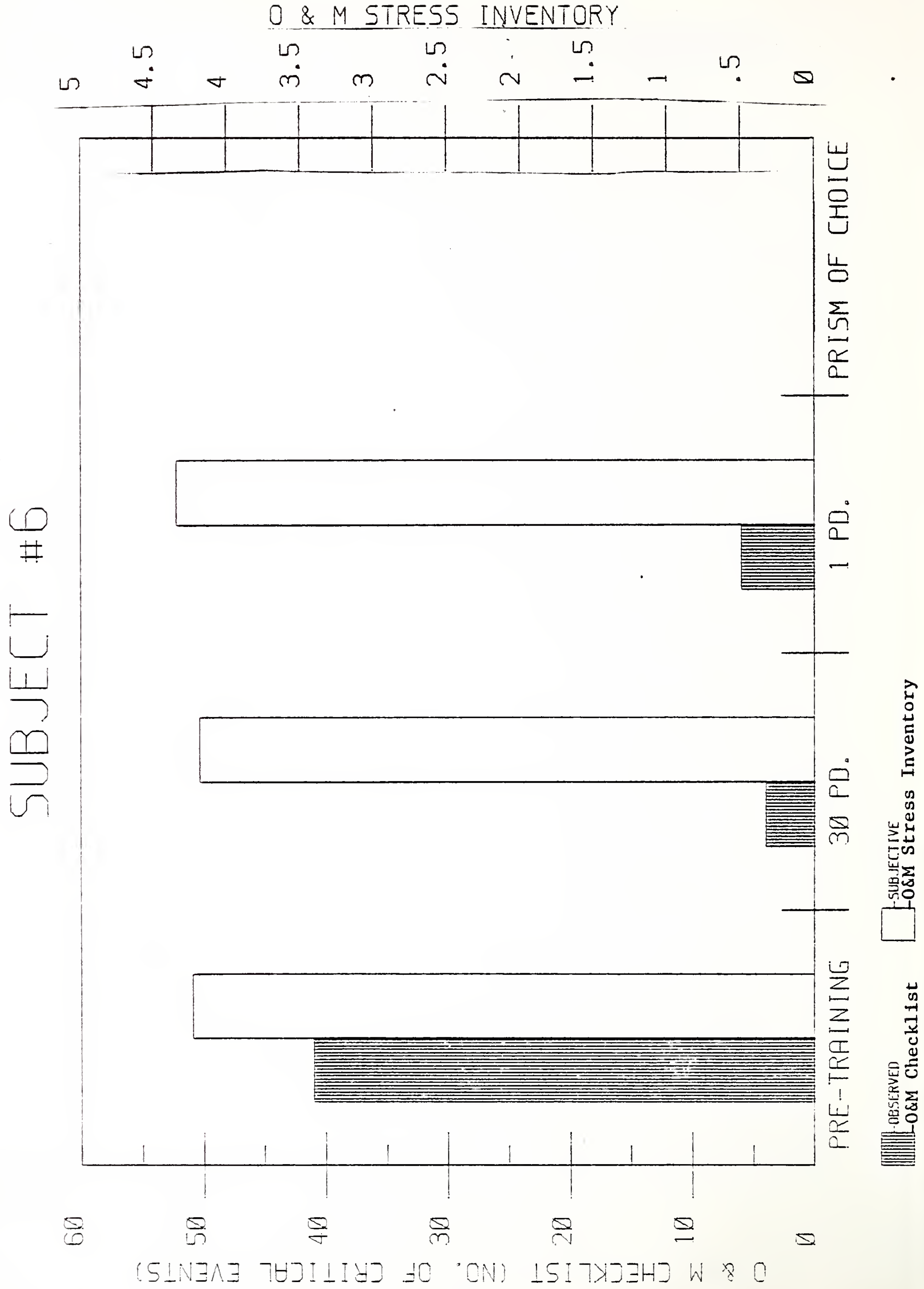
-"Walked into shoulder high display in store."

-"Didn't realize person was present in 'blind' area" (mentioned 3 times)

-"Doesn't enhance field"

-"Had to swing head too much" (a behavior noted prior to training)

-"Generated a lot of confusion and disorientation"


SUBJECT #6
O & M STRESS INVENTORY
5
4.5
4
3.5
3
2.5
2
1.5
1
.5
0
PRE-TRAINING
30 PD.
1 PD.
PRISM OF CHOICE
60
50
40
30
20
10
0
O & M CHECKLIST (NO. OF CRITICAL EVENTS)
OBSERVED
O&M Checklist
SUBJECTIVE
O&M Stress Inventory

Subject #7

Subject #7 is a 68 year old male with severe field loss and reduced acuity resulting from cataracts, detached retina and glaucoma. Clinical acuities were measured to be 20/50 in his right eye and only light perception (LP) in his left eye. Clinical fields were reported to be 10 degrees centrally. Health history included glaucoma, slight hearing loss, and heart problems. Medications for glaucoma and angina (nitroglycerin) were taken daily. He retired from his occupation as a welder in 1976, in part due to his vision loss.

His mobility was restricted to sighted guide with his wife. He never exercised alone, not even in his own backyard. He walked with a support cane, but used it more for mobility safety purposes. He came to the clinic specifically for help with mobility reporting that "I don't feel comfortable at all with helpers. I don't trust them." The three main mobility problems he reported at this time were:

1) "Moving around by myself"

2) "Crossing intersections"

3) "Finding a building I want to go into"

Summary of Pre-Training Structured Observations

Clinical acuities at this time were 20/70 O.D. and light perception O.S. Subject #7 reported that his vision fluctuates from day to day. Intraocular pressures were taken and shown to be within normal limits. Clinical fields again showed the 10 degree central field in the right eye. He wore a spectacle correction of -3.00 sphere. Functional visual fields were recorded as follows: When viewing straight ahead, a passerby was detected at 7 feet on the right and 12 feet on the left. When viewing to the right a passerby was detected at 3 feet and when viewing to the left a passerby was detected at 4 feet.

During this first mobility assessment, he experienced 41 mobility problems, most of which centered around "hugging" walls, veering, becoming disoriented and missing visual landmarks and objectives. His pace was extremely slow and cautious. His support cane was used to trail the wall. Breaks were necessary because of his shortness of breath. He also experienced problems with glare, and was dispensed a pair of absorptive sunlenses.

His measure on the O&M Stress Inventory was 4.16. His Spielberg anxiety score was 2.43, and his Personal Inventory score was 76. Subject #7 spoke often about his visual loss and how difficult it was: "Nobody knows how awful it is to be old and blind. Nobody wants to help. They're afraid to come by; afraid you're gonna ask them to do something for you." He felt he needed someone to listen to him as much as mobility training or aids.

After the initial mobility evaluation, he was fit with two 30 prism diopter lenses, one base-out, temporally and one base-in nasally on the right eye. The lenses were placed on his conventional glasses. Clinical acuities went from 20/50 O.D. without the prisms to 20/120 O.D. with the 30 prism diopter lenses. Functional visual field were as follows: Viewing straight ahead, he detected a passerby on his right side at 7 feet and at 12 feet on his left side. Viewing right, through the 30 prism diopter lenses, he detected the passerby at 2 1/2 feet; viewing left, through the 30 prism diopter lenses, he detected the passerby at 4 feet, representing only a slight improvement from his unaided side viewing.

Subject #7 was then given 15 hours of instruction in the use of the prisms.

Summary of Training Period with 30 prism diopter lens

Prior to prism training, basic cane skills were taught for approximately 5 hours. Subject #7 learned well, although the pace continued to be extremely slow with numerous breaks necessary. He was quite pleased with his new and convenient folding cane and used it frequently, even venturing alone in his backyard. As the lessons with the cane continued, his exercising increased and the need for breaks during training sessions decreased.

Prism training was then initiated. Progress was very slow throughout the entire 15 hours of instruction. Many breaks were necessary. Each session averaged approximately 30 minutes before a noticeable decline in his ability to accurately scan and judge prism displacement was evident. Contrast and lighting were a problem for him. If contrast was reduced, he wasn't always sure if he saw anything or not. In various contrasting and lighting situations his visual abilities fluctuated, and caused confusion for the subject. Eventually, he progressed to the point where he could walk while wearing the prisms. However, he was never quite able to consistently and accurately judge the actual position of objects while viewing through the prisms.

Despite his inconsistencies in performance during training, he did report an improvement at home due to what he described as "increased awareness of things." He further stated, "I think my headlamps are greased a lot better". Headlamps were the term used for his eyes. It felt easier for him to move his eyes now, whereas before they had been "set pretty much straight ahead on low beam."

Subject #7 was not able to successfully master using the prisms within the allotted research time, despite his level of motivation. He completed 15 hours of training, but needed several more sessions before he could use the prisms independently. At the completion of the 15 hours of training he was given a mobility evaluation, and 14 mobility problems were recorded compared with the initial 41 problems he experienced. The majority of the remaining problems centered on missing visual landmarks and objectives. He no longer "hugged the wall," and only veered slightly. His O&M Stress Inventory decreased significantly from 4.16 to 2.08. He felt he improved significantly in this area. His Spielberg anxiety score also decreased from 2.43 initially to 2.08, another positive indication. His Personal Inventory Score reflected a positive gain from his initial score of 76 to a final score of 83.

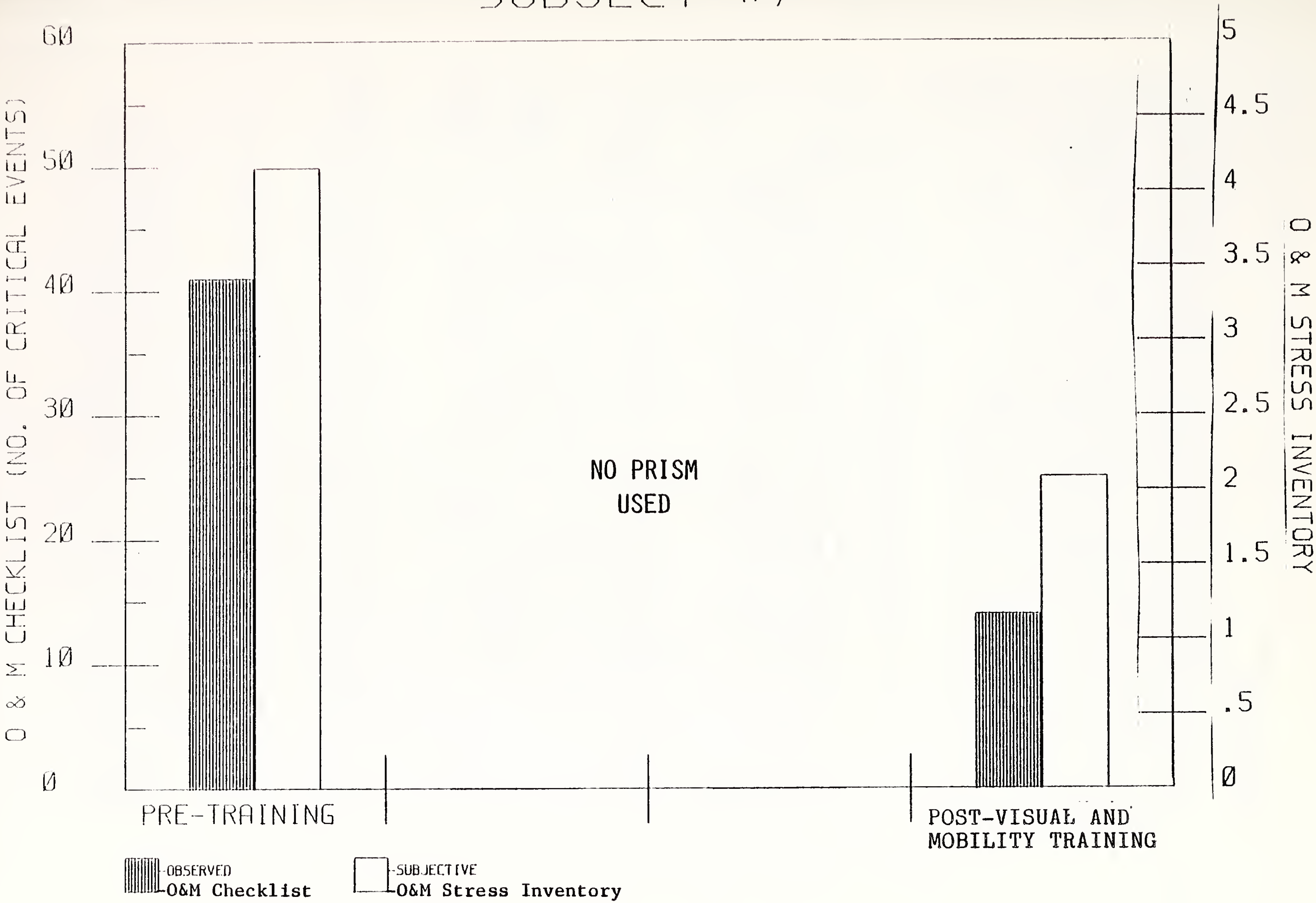
Discussion

Subject #7, although only 68, looked and performed as though he were much older. His general movements were slow in all areas, though it is conceivable that with continued hours of training he would eventually become more proficient in prism use.

Despite Subject #7's inability to follow the research protocol, he definitely benefited from the training with the 30 prism diopter lens. The prism was an excellent tool for teaching and increasing his visual scanning efficiency. The combination of visual scanning training, cane training and "finding someone I could talk to about my vision problems," contributed to a positive affect in his attitude and ability to deal with day-to-day situations. At the completion of the study he said, "I didn't think it was possible to feel good again. I praise God I found you people and got this training. You have truly made me a new man."

Subject #7 was referred for further O&M training, rehabilitation teaching and counseling at a local agency.

SUBJECT #7


60
50
40
30
20
10
0
O & M CHECKLIST (NO. OF CRITICAL EVENTS)
5
4.5
4
3.5
3
2.5
2
1.5
1
.5
0
O & M STRESS INVENTORY
NO PRISM USED
PRE-TRAINING
POST-VISUAL AND MOBILITY TRAINING
OBSERVED O&M Checklist
SUBJECTIVE O&M Stress Inventory

Subject #8

Subject #8 is a 45 year old male who presented with a history of retinitis pigmentosa, visual fields of 5 degrees centrally in both eyes and visual acuities of 20/50 O.D. and 20/30 O.S. He is a cook at a diner and only moves independently when traveling to and from work. He refuses to go out alone and chooses to spend all his time at either work or home. He listed his major mobility problems as -

1) "Finding steps and curbs"

2) "Bumping into things"

3) "Being afraid to cross streets, because I have to constantly look around"

He reported an intense fear of losing all his vision and not being able to provide for his family. The subject, a former seaman no longer enjoys his faviorite leisure activities of fishing and skin diving, and admitted totally closing himself off socially because of his feelings about his vision loss.

The subject desired the prisms to alleviate his occupational problems. For instance, if his kitchen co-workers moved things such as ingredients, he always had to ask where they were, because it was quicker, than looking for them. He wanted the prisms to improve his awareness of his working environment. The prisms were not wanted for mobility purposes, because his only independent travel consisted of his trips to and from work routes which he has long since memorized. Use of a cane was declined because of his own embarrassment and feelings that others would pity him and consider him "blind."

Judging from functional fields, clinical acuities and clinical fields, he was an excellent candidate for Fresnel prism use. He responded well to visual and mobility training with plano lenses and 30 prism diopter base-out lenses placed temporally O.U. Throughout his training he demonstrated enhanced awareness and a positive attitude about his increased visual efficiency.

Shortly after he was sent home to wear the 30 prism diopter lenses, he scheduled an appointment to return. At that time, he voluntarily removed himself from the research study, because the prisms were more of a hindrance than a help. This was surprising, considering his excellent response to training.

He explained the problem with the prism as follows. Because there is much heat and steam in the kitchen at work, he would sweat profusely, causing the glasses to slip down his nose and him to continually "fuss" with them. A headband was offered as a solution, however, he could not adjust to the discomfort of wearing spectacles while he worked in the kitchen, let alone having them adhering tightly to his face. He felt that the prisms would be useful for people with problems similar to his, but who worked in better conditions. He also stated that the prisms would probably would be helpful in traveling for other people, but he had no desire to use them, as he memorized his route to work.

This case illustrates the importance of understanding the specifics of each person's particular need and use of the prisms. One would assume from this subject's clinical and training results that he was an excellent candidate who should have benefitted from prism use. However, a closer examination of environmental conditions, attitudes, lifestyle, etc. proved differently. Though he was initially motivated, his work situation compounded his problems and influenced his decision not to use the prism. This case exemplifies the need and value of follow-up and problem-solving during all stages of the vision rehabilitation process. A further session with the subject revealed his major disapointment concerned the lack of night vision improvement or vision restoration which he expected the lenses would provide. "Getting back my former vision was my real agenda." He had also intended to send for his brothers in Greece, all of whom have retinitis pigmentosa. He wanted to "give them the gift of sight again" if all had gone as he hoped.

Counseling and further mobility training, which he declined, was made available to this subject and he will be recontacted as part of our standard follow-up program.

Subject #9

Subject #9 is a 34 year old female who reported with retrolental fibroplasia and secondary complications of aphakia and glaucoma. Her visual acuities were recorded no light perception O.D. and 20/120 O.S. She demonstrated a 10 degree central visual field with a small 10 degree island of vision 40 to 50 degrees into the inferior-temporal quadrant. She is taking medication for her glaucoma and considered her general health to be good. Her leisure activities include music, playing piano, and attending concerts and the ballet. She reported here three major mobility problems as follows:

1) "Traveling in crowded areas and public places"

2) "Entering busy areas and experiencing sensory overload"

3) "Depth perception and balance problems causing tentative movement"

Though subject #9 was eligible for the study and initiated training, she voluntarily dropped out of the training due to scheduling problems.

Subject #10

Subject #10 is a 10 year old boy who presented with advanced retinitis pigmentosa, 5 degree central fields O.U. and visual acuities of 20/30 O.U. He reported his three major mobility problems as:

-"Sunlight bothers me, but I can't see in the dark"

-"Sometimes I bump into things"

-"I trip over things and down steps"

The subject was determined eligible for the study and trained in the use of Fresnel prisms. This subject however, was terminated from the study due to gross inconsistencies in his answers to all evaluation measures. When questions were repeated, he frequently answered exactly the opposite from his previous response of one minute ago. It was felt by three of the evaluators that the boy did not understand the questions and rating systems. He refused to wear his lenses and participated in the study only so he could "visit his favorite girlfriends" at the clinic. While this subject was a "favorite" of the clinic personnel and we continued mobility training as needed, it was done outside the parameters of this research protocol.

Areas Of Interest - Summary

Of the seven who participated in the study, 4 chose 30 prism diopter lenses, 2 chose 1 prism diopter lenses and 1, thouth he completed 15 hours of training, was unable to learn to use the prism for full-time wear. In order to synthesize the individual case studies into general conclusions, the following observations from this project are presented:

1. Enhanced awareness of and interaction with environment in mobility situations.

    - All seven noted both in comments during training and in their journals, that they experienced enhanced visual awareness of the environment. Even subjects who did not eventually choose the 30 prism diopter lenses noted that they could scan better.
    - All seven had fewer mobility problems at the end of the study than when they began the study.

The summary of mobility critical events(C7) presents the rather profound effect which mobility and visual training in the use of 30 prism diopter lenses had on the unwanted contacts and overall level of mobility functioning for six subjects. Of particular interest is the decrease in scores for bumping into objects (22 to 6) and people (26 to 8), which were described by the clients as major difficulties in independent mobility. Additionally the area of missing visual landmarks (20 to 0) and missing items sought in a store (20 to 8) suggest that orientation may also be improved with the use of Fresnel prisms.

- The two who chose 1 prism diopter lenses also noted increased awareness. However, one became so efficient at scanning he decided he liked viewing better through the placebo because it was clearer. The other could simply not adjust to the "confusion" created by the displacement of the 30 prism diopter lens, even after training.
- Functional fields: Unaided functional fields showed an increase in a majority of cases. However, due to small sample size it is not possible to make any conclusions. This is an area for future study.

2. Subjective reports of less stress in mobility situations.

- According to answers on the O&M Stress Inventory Questionnaire all subjects subjectively reported lower feelings of stress in mobility situations at the end of the study than they had experienced when they first began.

3. Fewer undesired contacts with people and objects in mobility situations.

   - At completion of training all subjects were observed to have fewer undesired contacts during mobility evaluations and stated such in their journals.

4. Overall enhanced self-image and feelings of self-worth.

   - The Personal Inventory and Spielberg's Stress Training Anxiety Scale were administered to all subjects. Using the instruments, it is not possible to discern any meaningful relationship between the use of the prisms and enhanced self-image.

In conclusion, while a small number of participants limits our ability to generalize our findings, it is apparent both objectively, as demonstrated by the data, and subjectively, from the client and instructor comments, that mobility and visual training in the use of 30 prism diopter of Fresnel prisms offers a viable option for the person who is having mobility problems which are associated with severely constricted visual fields.

The following section presents summary data on subjective and objective measurements of various components of this research study.

The critical events recorded during the pretraining period and those recorded after initial training with the 30 prism diopter lenses are presented in the following table.

Prior to mobility training and prism use, a total of 55 "undesired contacts" were recorded, including bumping into objects (22), bumping into people (26), bumping into walls (2), and bumping into overhead obstacles (5). After training and with use of the 30 prism diopter lenses, the total dropped to 14 events.

The second category consisted of problems with depth perception. A total of 37 problems consisting of missing dropooffs and curbs (16), tripping over

TABLE I

STATE TRAIT ANXIETY MEASURE: MEAN SCORES

	Trial 1	Trial 2	Trial 3	Trial 4
Subject 1	2.0	1.95	2.15	1.65
Subject 2	1.75	2.05	1.95	1.95
Subject 3	2.65	2.05	——	2.40
Subject 4	2.50	1.90	2.20	2.20
Subject 5	2.85	3.05	3.2	3.0
Subject 6	2.65	2.85	2.68	——
Subject 7	2.43	2.08	——	——
Total Mean Scores	2.4	2.28	2.43	2.24

TABLE II

PERSONAL INVENTORY: MEAN SCORES

	Trial 1	Trial 2	Trial 3	Trial 4
Subject 1	58	77	99	99
Subject 2	79	83	86	93
Subject 3	82	77	69	79
Subject 4	73	71	65	69
Subject 5	85	83	85	87
Subject 6	61	72	72	--
Subject 7	76	83	--	--
Total Mean Scores	73	78	79.33	85.40

The Spielberg Measurement and the Personal Inventory above were administered 4 times. Data is presented for the 7 clients who completed the prism training. The data from the Spielberg ranged from 1.75 to 2.85 with a mean of 2.40. On the final administration the range was from 1.65 to 3.00 with a mean of 2.24. This data reflects a slight downward trend into the more positive area however, the changes are so small and the sample size so small that any conclusive statements are impossible to make at this time.

On the first administation of the Personal Inventory, scores ranged from 58 to 85 with a mean of 73. On the final post-test, the range was 69 to 99 with a mean of 85.4. While this increase in scores is not being analyzed inferentially, it does reflect a positive trend and one which with a larger sample size may prove to be significant.

TABLE III

COMPOSITE SUMMARY OF MOBILITY CRITICAL EVENTS
PRE/POST TRAINING & FRESNEL PRISMS - 30 DIOPTER PRISM LENSES *

		PRE	POST
I.	Scanning Problems		
	-Missing Visual Landmarks	20	0
	-Missing Items Sought in Store	20	8
	-Missing Adjacent People	10	3
	-Missing Objects in Building	5	0
	-Missing Oncoming Cars	2	0
	-Excessive Head Movement	7	0
II.	Bumping into Things		
	-Bumping into Objects	22	6
	-Bumping into People	26	8
	-Bumping into Walls	2	0
	-Bumping into Overhead Obstacles	5	0
III.	Depth Perception Problems		
	-Missing Drop-offs & Curbs	16	9
	-Tripping Over Low-lying Objects	13	1
	-Overstepping (curbs, etc.)	3	0
	-Over/underreaching	5	0
IV.	Excessive Slowing of Pace in Crowds	12	4
V.	"Hugging" Walls/Shorelines/ Buildings	10	2
VI.	Veering or Wandering Inappropriately	9	1
VII.	Feet Shuffling	5	0

*This summary is for the six subjects who completed 30 prism diopter lens wear.

low-lying objects (13), overstepping (3), and over/under reaching (5) were recorded in the pretraining evaluation. Subsequent to training with the 30 prism diopter lenses the incidences of depth perception problems dropped to 10.

Inappropriate scanning accounted for a total of 64 recorded problems during the pretraining period. Specific events included missing visual landmarks (20), missing items sought in stores (20), missing adjacent people (10), missing objects in buildings (5), missing oncoming cars (2), and excessive head movement (7). After training and with use of the 30 prism diopter lenses the total number of problems dropped to 11.

Excessive slowing of pace in crowds was listed 12 times before training and four times after. Veering or wandering inappropriately fell from nine occurrences to one. The incidence of "hugging" walls, shorelines, or buildings was reduced from ten to two. Shuffling of feet occurred five times before training and was not noted after training.

The overall picture of vastly improved travel performance is quite vivid. In all categories and subcategories, the occurrances of mobility problems were drastically reduced after visual and mobility training in the use of prisms took place.

SUMMARY OF TRAVEL PROBLEMS

Upon entry into this project, the subjects were asked what they considered to be their three most significant mobility problems. The responses of all ten subjects are included.

SUBJECT 1

1. Finding and going down steps.
2. Traveling in crowded areas and bumping into people.
3. In social situations, having to concentrate on one thing at a time.

SUBJECT 2

1. Negotiating public transportation.
2. Knowing when another person is present.
3. Crossing intersections.

SUBJECT 3

1. Bumping into people crossing in front of him unexpectedly.

2. Low-lying unexpected objects.
3. Being afraid to cross streets.

SUBJECT 4

1. Traveling at night.
2. Unfamiliar intersections.
3. High noise.

SUBJECT 5

1. Glare.
2. Bumping people.
3. Missing drop offs and stepping off curbs.

SUBJECT 6

1. Bumping things and people.
2. Something, or someone bumping him.
3. Fear of demoralizing inadequacy.

SUBJECT 7

1. Moving around alone.
2. Crossing intersections.
3. Finding a specific building.

SUBJECT 8

1. Finding steps and curbs.
2. Bumping into things.
3. Being afraid to cross streets.

SUBJECT 9

1. Crowded areas and public places.
2. Walking into busy rooms.
3. Tentative movement caused by poor depth perception.

SUBJECT 10

1. Glare problems.
2. Bumping into things.
3. Tripping over things and down steps.

The most frequently mentioned classes of problems concerned:

1. Finding steps and curbs (depth perception) 6 cases
2. Bumping into persons or things 4 cases
3. Crossing intersections 4 cases
4. Crowded situations and Public places 4 cases

Based on previous experiences, evaluators in this project felt that the above mentioned problems accurately reflected the typical mobility problems mentioned by people with severely constricted fields of view.

These subjective observations were then compared with the objective mobility evaluations to ascertain any similarities or differences in perceptions of major mobility problems. The following summary of the mobility critical events table indicates that the major instructor-observed mobilty problems for individuals with constricted fields of view are as follows:

(1) Scanning Problems
(2) Bumping into objects, people, etc.
(3) Depth perception problems

The following table breaks these problems down into greater detail. There was agreement between subjects and instructors on two of the top three problems (depth perception and bumping into things). It is interesting to note that scanning difficulty was not even mentioned as a major problem by the subjects, but was the most prevalent problem observed during formal mobility evaluation. While some might assume that individuals with constricted fields of view might automatically compensate by increased and more efficient scanning methods, it was noted instead, that subjects demonstrated either constricted visual behaviors, similar to their constricted visual fields, or random and inefficient scanning. This is consistent with observations made by the O&M specialists in this study in relationship to their previous clients with constricted visual fields.

It is virtually impossible to dissociate scanning problems from those associated with bumping into things and depth perception difficulties. Instead subjects identified the effect of poor scanning as opposed to specifically mentioning scanning as the major problem. If you consider the effect of poor scanning, it becomes apparent that subject identified problems #2,3,4 are all a result of poor scanning. Maximum scanning, while not eliminating these problems, can minimize these difficulties.

In conclusion, the authors feel there is agreement between the problems articulated by the subjects and the problems observed by the mobility instructors. These problems can be grouped into 2

TABLE IV

SUMMARY OF MOBILITY CRITICAL EVENTS CHECKLIST

	Pre			30△			1△			Choice - 30△		
	L	R	F	L	R	F	L	R	F	L	R	F
Subject 1												
Undesired Contacts												
-Bumping into Objects	5	5		2	2		2	3				
-Bumping into People	3	4		2	2							
-Bumping into Overhead Obstacles		1										
Depth Perception Problem												
-Tripping Over Low-lying Objects		6						1	1			1
-Oversteppipng (curbs, etc.)			1						2			
-Over/underreaching		2										
Inappropriate Scanning												
-Missing Visual Landmarks		2										
-Missing Items Sought in Store	2	3		1	2		1	3		1	1	
-Missing Adjacent People	2	3					2	2				
-Missing Objects in Building	1	1										
-Excessive Head Movement	2	2										
Excessive Slowing of Pace in Crowds	1	1	1			2			1			
Veering or Wandering Inappropriately	2	3	1		1		2	3			1	
"Hugging" Walls/Shorelines/Buildings					2							
Subject 2										Choice - 30△		
Undesired Contacts												
-Bumping into Objects	1						1					
-Bumping into People	1						1					No Problems
Inappropriate Scanning												
-Excessive Head Movement	3											
-Excessive Slowing of Pace in Crowds			3			1			3			

TABLE IV.1

	Pre			30^{Δ}			1^{Δ}			Choice - 30^{Δ}		
	L	R	F	L	R	F	L	R	F	L	R	F
Subject 3												
Undesired Contacts												
-Bumping into Objects	4			1			3					1
-Bumping into People	8			3			5			1		1
-Bumping into Walls					1							
-Bumping into Overhead Obstacles	4											
Depth Perception Problems												
-Tripping Over Low-Lying Objects			3			1						
-Overstepping (curbs, etc.)			2									
Inappropriate Scanning												
-Missing Visual Landmarks	1											
Excessive Slowing of Pace in Crowds			3			1			2			1
"Hugging" Walls/Shorelines/Buildings		4										
Subject 4										Choice - 30^{Δ}		
Undesired Contacts												
-Bumping into Objects	1	1					2					
-Bumping into People	2						5					
-Bumping into Walls	2											
Depth Perception Problems												
-Missing Drop-offs Subway Platforms	3	3	3	3	3	3	3	3	3			
-Tripping Over Low-lying Objects												1
Inappropriate Scanning												
-Missing Visual Landmarks	3											
-Missing Items Sought in Store	5			4			2					
-Missing Adjacent People	1	1					1	1				
-Missing Objects in Building	5											
"Hugging" Walls/Shorelines/Buildings	4	1										

TABLE IV.2

	Pre			30 Δ			1 Δ			Choice 1 Δ		
	L	R	F	L	R	F	L	R	F	L	R	F
Subject 5												
Undesired Contacts												
-Bumping into People	5						2					
Depth Percpetion Problems												
-Over/underreaching	1	3										
Inappropriate Scanning												
-Missing Visual Landmarks	5											
-Missing Items Sought in Store	5			1								
-Missing Adjacent People	3			1						1		
"Hugging" Walls/Shorelines/Buildings		1										
Subject 6										Did Not Prefer Either Prism		
Undesired Contacts												
-Bumping into Objects	3	2			1		4					
-Bumping into People	3				1							
Depth Perception Problems												
-Missing Drop-offs & Curbs			7									
-Tripping Over Low-lying Objects			4									
Inappropriate Scanning												
-Missing Visual Landmarks	5	4					1					
-Missing Adjacent People				1	1			1				
-Missing Oncoming Cars	1	1										
-Excessive Head Movement		3										
Excessive Slowing of Pace in Crowds			3									
Feet Shuffling			5									

TABLE IV.3

	No Visual Trng/ Cane Pre			Visual/Trng/ Cane Post		
	L	R	F	L	R	F
Subject 7						
Undesired Contacts						
-Bumping into Objects	2			1		
Depth Perception Problems						
-Tripping Over Low-lying Objects			4			
-Overstepping (curbs, etc.)			3			
Inappropriate Scanning						
-Missing Visual Landmarks	5	5	3	3	2	1
-Missing Items Sought in Store	2	2		2	2	
"Hugging" Walls/Shorelines/Buildings	5					

categories: (1) depth perception and (2) scanning problems, which are manifested as bumping into obstacles, people, etc. and having difficulty in crowded situations.

SUMMARY OF ADVANTAGES AND DISADVANTAGES OF FRESNEL PRISMS AS RECORDED IN SUBJECT'S JOURNAL

The following are attempts to summarize the subject entries in the journals regarding specific advantages and disadvantages of Fresnel prism use. These responses and their frequencies are listed in tabular form in the following table.

The most frequently mentioned advantage of the 30 prism diopter lenses was a sense of good adjustment in travel situations (18). There were also thirteen comments concerning the system's value in seeing people and/or objects on the subject's "blind" side. A total of fifty nine positive statements concerning the 30 diopter prisms were obtained from this analysis of the journals.

On the negative side, there were seven complaints of not being able to adapt to eye movements with the 30 prism diopter lenses. Six complaints concerning displacement, and five referring to distance distortion were also noted. A total of forty four negative comments about this system were found.

The most common positive comment concerning the 1 prism diopter system was the clarity (four). A total of only nine positive comments were recorded. The major negative factor concerned the subjective lack of improvement derived from the system. This was mentioned thirty four times in the journals. A total of forty five negative comments were obtained concerning 1 prism diopter lens usage.

RESEARCH UTILIZATION PLANS

In addition to the dissemination of results already described in Part III - Training, the following presentations, articles and publication of results are planned:

- July, 1983, Phoenix-meeting of the American Association of Workers for the Blind - presentation to the Orientation and Mobility Interest Group on the results of Project #3.

- 1984, Tennessee-joint national meeting of the

TABLE V

COMPOSITE JOURNAL NOTES

30 prism diopter lens

	ADVANTAGES		DISADVANTAGES
18	Good adjustment in travel situations	7	Couldn't get used to eye movements
13	Helpful for seeing objects/people on blind side	6	Displacement
5	Helpful in department store	5	Distortion/Things seem closer/lower than they are
5	Helped to identify as someone with a vision problem (helped alleviate embarrassment)	4	Cuts down acuity/vision/clearness
4	Helpful for viewing things when riding in a car	3	Calls attention from public
3	Increases eye movements	3	Objects/People "disappear" at prism edge
3	Helpful in grocery store	2	Glare
2	Less problems in crowded areas	2	Problems wearing in rain
2	No lighting problems	2	Fogged up when cooking
2	Doesn't interfere with reading/central vision activities	2	Problems in dim/night areas
1	Less problems with eating	2	Not good for low-lying objects
1	Easy to adapt to displacement	2	Problems distinguishing colors through prism
		2	More problems in crowded situations
		2	Overstepping

---

1 prism diopter lens

4	Clearer vision - less "cloudy"	34	Don't give any improvement
2	Scanning more	4	Crowded areas, hallway corners, stairs & ramps "stressful"
2	Displacement (confusion) reduced	2	Tripped on steps
1	No problems traveling in home area	2	Missed pedestrians/bikers
		1	Have to turn head more

American Association of Workers for the Blind and Association of Educators of the Visually Handicapped - interdisciplinary presentation of clinical and rehabilitation intervention for low vision individuals with constricted visual fields.

- 1984 Annual American Academy of Optometry Meeting-interdisciplinary Optometric and Mobility presentation of the results of Project #3.
- Journal article planned for the Journal of Visual Impairment and Blindness on the functional evaluation and training (low vision) protocol for the use of Fresnel prisms for individuals with constricted fields.
- A copy of the Fresnel prism training protocol will be disseminated to University and College programs around the country involved in the professional preparation of Orientation and Mobility Specialists.
- The eye care specialists' protocol as well as any of the projects' results will be made available to interested eye care specialists and Universities and Colleges of Optometry.
- The Fresnel prism training protocol will continued to be field tested at the Wm. Feinbloom Vision Rehabilitation Center as part of its' National Institute of Handicapped Research and Development Grant awarded to the PA College of Optometry for 1983-85.
- Patient records and results of evaluation and training will be added to the WFVRC database and expanded in a program to compare results and generate further statistical information on this project.

A chapter on Fresnel prism and their use in the rehabilitation of low vision individuals with constricted visual fields will be written for the book Low Vision Rehabilitation: An Interdisciplinary Enphasis to be published by the PA College of Optometry Press, 1983.

PART 3

TRAINING

PART 3: TRAINING

Training is a significant component in assuring research is applied or used broadly. Although the Low Vision Research and Training Center began in January and research results were not available until the end of the year, staff conducted or participated in over 44 training events based on available low vision knowledge and practice. Audiences included, but were not limited to, rehabilitation professionals, eye care specialists, educators, and consumers (see Appendix D.10-12 for participant distributions. Approximately 1,896 individuals were given the opportunity to increase their knowledge of the effects of low vision, optical and non-optical low vision aids, near and distance training in the use of residual vision, and/or ways to assist low vision patients with other specialized goals.

SURVEYS:

A regional survey was conducted to determine training needs of rehabilitation counselors, rehabilitation teachers, mobility specialists in rehabilitation agencies in RSA Region 3 (VA, WV, DC, DE, PA, MD) and in New Jersey. A separate survey but similar form was completed by supervisors and administrators to ascertain their perception of staff needs. Two hundred and thirty responses were received and analyzed (see sample surveys and details in Appendix D1&2). The greatest gaps between knowledge level and job relevance on key low vision topics were identified as-

1. training with visual field enhancement systems

2. training without optical aids

3. functional implications of low vision

4. training with near optical aids

5. vision stimulation

6. working with multihandicapped

7. modifying the work environment

8. training with distance optical aids

9. psychosocial aspects of low vision

10. functional interpretations of the eye report

11. working with the learning disabled (with low vision)

12-3. environmental modifications for travel and home

14. low vision examination

15. marketing strategies

These guided the design of the Regional Low Vision Training Workshop conducted November 3-5, 1982.

In addition, thirty-four respondents to an eye care specialists survey conducted in Pennsylvania (see Appendix D4) reflected slightly different weaknesses in the field of low vision. They indicated insufficient knowledge in the following areas:

1. resources for financial assistance for purchases of aids or services

2. increasing visual efficiency without optical aids

3. training with visual field enhancement systems

4. prescribing non-optical aids for specific patient goals

5. vision stimulation

6 & 7. training with near and distance optical aids

8. prescribing low vision aids such as telemicroscopes and visual field enhancement systems

9. resources for helping low vision patients and their families adjust to low vision

Detailed responses to questions related to major problems experienced in serving low vision patients as well as training recommendations for eye care specialists are listed in Appendix D5.

REGIONAL WORKSHOP:

The major training event drew over 100 participants from ten rehabilitation agencies in seven states (MD, DC, DE, WV, VA, PA, NJ) private agencies and eye care specialists' offices in PA. The objectives were developed to meet the needs of a diverse group of professionals having varied levels of knowledge and experience yet needing to understand the interdisciplinary service delivery process. The objectives by tracts were-

Intermediate Tract:

- o to sequentially and systemically explore the field of low vision and its applications to service delivery
- o to exchange ideas with speakers and co-participants
- o to be familiar with near and distance optical aids
- o to develop methods for applying workshop information and strategies

Advanced Tract:

- o to update knowledge and skills in serving low vision individuals
- o to clarify problems and identify relevant options for enhancing service delivery
- o to increase knowledge in new optical and nonoptical technology
- o to map out strategies for applying information and ideas gained from the workshop

Eye Care Specialists Tract:

- o to update eye care specialists on the latest advances in the field of low vision
- o to increase knowledge of interdisciplinary roles and resources enhancing vision care to low vision patients
- o to increase understanding of the functional implications of low vision services

The design of this learning experience included three full days of intensive interdisciplinary sessions using panels, slides, lectures, small group problem solving sessions, and hands-on activities. The agenda, participant lists, speakers, exhibitors, and summative information are detailed in Appendix D.6-11.

Speakers were individuals with reputations for low vision leadership and demonstrated the close ties between the Mississippi Blindness and Low Vision Research and Training Center and the PCO Low Vision Research and Training Center. Exhibits were an integral part of the program especially during the "hands-on experiences with optical and non-optical aids". All participants were rotated through each major exhibit as well as the classroom instructional activities. The exhibitors assisted in problem solving activities for the advanced tract participants.

According to participant reactions the staff were successful in meeting the objectives. Participants consistently complimented the quality of the content selection, skill of speakers and the organization of this event. They also rated it a 4.4 out of 5 points.

The results of the training event are dependent more on application than on how well participants felt the learning opportunity was organized and conducted. To aid in application, each participant prepared an action plan to forward to his/her supervisor and a copy was submitted to the workshop sponsors for follow-up later. A summary of the at-home applications developed are shown in Appendix D11b.

OTHER TRAINING EVENTS:

Consumers, parents of consumers, rehabilitation professionals (with both public and private agencies), and members of associations focusing on visual impairments also received ample learning opportunities this year through staff of the Low Vision Research and Training Center. Approximately 43 half to one-day training presentations were made to approximately 1,796 individuals. Outlines of the objectives, participants, speakers, dates, location, and organization served are available in Appendix D12&13. Objectives ranged from creating awareness of visual problems to skill training in the use of optical aids. Audience size varied from 8 to 200. Many of the events were conducted by team teachers representing the interdisciplinary approach in service delivery. A series of training sessions were conducted for one public agency across the entire state. The reactions to these many learning opportunities was very positive.

TRAINING BUDGET:

The extensive training activities conducted during the one-year grant period represented 40% of the total grant budget of $342,924. Thirty two and two tenths (32.2%) percent was funded by NIHR and seven and eight tenths (7.8%) percent by PCO. Where possible speaking engagements were consolidated to conserve travel monies. The expenses for the regional training event were defrayed partially by contributions from vendors many of whom exhibited and contributed to the hands-on training.

The entire training program has been a total group effort involving all internal staff as well as varied public and private organizations serving the visually impaired.

PART 4

INTRA & INTERORGANIZATIONAL COOPERATION

PART 4 - INTRA & INTERORGANIZATIONAL COOPERATION

To assist the Low Vision Research & Training Center in conducting research & training activities successfully, the staff made special efforts to develop and nurture mutually beneficial liaisons internally within the Pennsylvania College of Optometry (PCO) as well as with selected public and private organizations.

INTRAORGANIZATIONAL EFFORTS

WM. FEINBLOOM VISION REHABILITATION CENTER:

The interdisciplinary low vision service delivery arm of the Pennsylvania College of Optometry (PCO) (under The Eye Institute also known as TEI) is the Wm. Feinbloom Vision Rehabilitation Center (WFVRC). Many of the WFVRC staff members have contributed significantly to the NIHR-sponsored research efforts. Social workers helped develop, administer and analyze the results of the psychosocial instruments and the intake module for the data base and assisted researchers as needed in initial interviews with Project 2 and 3 research patients. Optometrists assisted in developing the optometric module for the data base, provided clinical examinations on research patients, and provided their expertise in planning and carrying out the research methodology. The functional module for the data base as well as the research activities related to functionally-oriented patient assessments and training with, and without, optical aids were conducted with much support from the mobility specialists and educational specialists at WFVRC. Its interdisciplinary team, has espoused the philosophy and many of the approaches the Low Vision Research & Training Center feel are of utmost importance for effective services to the low vision population. Their expertise was used in the many training events conducted this year for rehabilitation professionals, consumers, eye care specialists and others.

PCO CONTINUING EDUCATION DEPARTMENT:

In conducting the regional and state training events the Continuing Education Department of the Pennsylvania College of Optometry was most helpful. They reviewed and approved course content, provided certificates and provided continuing education credits to participants.

PCO NEURO/VISUAL SCIENCE TRACT:

Researchers in the Neuro Visual Science Tract have cooperated readily in the design and implementation of research projects, especially the projects involving development of a low vision computerized information system and the use of biofeedback for teaching eccentric viewing. These staff members have been excellent resources also for assisting in solving various problems that occurred this year.

OTHER PCO DEPARTMENTS AND TRACTS:

Administrators, educational tract coordinators, public relations representatives, and other key college personnel have been invaluable in facilitating the integration of the Low Vision Research & Training Center activities into the college and clinical practice programs. Although one year is insufficient for the development and implementation of research and training activities as well as the comprehensive integration of these into the college and clinical practice programs significant progress was made thanks to the top-level support received.

INTERORGANIZATIONAL EFFORTS

EASTERN BLIND REHABILITATION CENTER:

Long range plans included the development of a low vision data base network among selected clinics and centers serving this population. Through the efforts of Dr. William De l'Aune, consultant to research Project 1, the model low vision data base developed reflects the views, and many of the needs, of the Eastern Blind Rehabilitation Center, Veteran's Administration Hospital (in West Haven, Connecticut). Not only did staff provide initial data elements to consider in developing this model, but staff also reviewed drafts of forms developed and contributed suggestions. An interchange of data has been planned and with additional funding will be initiated between the two centers to combine data, thereby expanding the sampling size and types of patients included.

PA BLINDNESS & VISUAL SERVICES (BVS):

BVS, a state-federal rehabilitation agency focusing on visual impairments, was actively involved with Low Vision Research & Training Center activities, especially training ones. Low vision training for eye care specialists, arranged at the request of BVS, was based on the results of the Research & Training Center needs assessment survey and was held in conjunction with the Regional Low Vision Training Workshop. Rehabilitation professionals from this agency received two opportunities for upgrading their knowledge and skills in low vision--first through localized basic training programs and second through the Regional Workshop which offered intermediate and advanced tracts for participants from seven states.

In addition, the director of BVS, has served this year in an advisory capacity for planning and implementing research and training activities.

OTHER PUBLIC REHABILITATION AGENCIES:

Rehabilitation agencies in RSA Region III and the New Jersey Commission for the Blind participated in the Regional Low Vision Training Needs Survey for rehabilitation professionals and their supervisors/administrators as well as in the Regional Low Vision Training Workshop. The training staff of RSA Region 3 rehabilitation agencies have been an excellent resource in the selection and participation of rehabilitation professionals in our activities. Follow-up information was disseminated after the regional training event to all participants to reinforce the learning experience. Research results will be forwarded to rehabilitation agencies also.

ELWYN INSTITUTES:

Elwyn Institute, a private, non-profit residential and nonresidential rehabilitation and educational institution program, has worked closely with WFVRC and the Low Vision Research and Training Center in a number of ways. First, staff have been shared as needed between patient care, research, and educational events. Second, the low vision computerized data base formats have been reviewed for application to the visually impaired with and without secondary disabilities among their student, resident, and client populations. Third, they also provided staff support for the Regional Low Vision Training Workshop. The Low Vision Research & Training Center has been successful, in part, because of such cooperative relationships.

NEVIL INSTITUTE FOR REHABILITATION SERVICES:

Nevil Institute for Rehabilitation Services offers individual and family counseling, life skills education, orientation and mobility instruction, rehabilitation teaching, psychological testing and evaluation, reader service, talking book demonstration, transportation, and information and referral services to visually impaired. They are very much interested in the low vision data base network concept and have received forms developed to date. Staff at Nevil have provided the Research & Training Center with radio publicity and participated in the Regional Low Vision Training Workshop. Additional plans have been discussed for future follow-up activities, provided funding is available.

RSA REGION III OFFICE:

The regional office has been very supportive of the Low Vision Research & Training Center. The director and his staff have served on the Research & Training Center National Advisory Committee and offered guidance in planning, in clarifying NIHR policies and practices, and in resolving problems. In addition, the regional office actively supported the Regional Low Vision Training Workshop with participation on the program.

CONSUMER LIAISONS:

Consumers have been involved in the Center activities as consultants, research patients, and active participants in low vision training programs conducted this year.

SUMMARY:

Interaction on a consistent and systematic basis with a number of groups has proven essential to success. Staff have used every opportunity possible to discuss ideas, strategies, and activities with individuals and groups gathered for conferences or advisory meetings, researchers visiting PCO, and other informal occasions. Conference contacts have included, not been limited to, the American Association for the Blind, the American Academy of Optometry, the American Public Health Association, and others listed in Appendix D13.

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APPENDIX A

WM. FEINBLOOM VISION REHABILITATION CN
INTAKE FORM

I. GENERAL INFORMATION

1. ID/Record #:__________ (6)
2. Date of Exam: __ / __ / __
3. 1) Local 2) 4-day
4. Previous services at WFVRC? (y) (n)
5. Last WFVRC visit: __ / __ / __
6. **Last Name:** ________________ (13)
7. **First Name:** _____________ (11)
8. Middle Initial: __
9. Street Address:
________________________________ (30)
10. City: ____________________ (15)
11. State/Country: ______________ (10)
12. Zip Code: _________ (5)
13. Home Telephone: (____) ____-_____
14. Work Telephone: (____) ____-_____
15. Community: 1)Urban 2)Suburb 3)Rural
16. Date of Birth: __ / __ / __
17. Sex: (M) (F)
18. Race: (W)hite (B)lack (H)ispanic
(A)sian (N)ative American (O)ther
19. Marital Status:
1) Married 2) Widowed
3) Divorced 4) Separated
5) Never married
20. # of Dependents (IRS) ___
21. Accompanied by:(Name)
____
(Phone) (____) ____-_____
22. Living situation: (max=2)
1) Spouse 2) Child
3) Parents 4) Friends
5) Alone 6) Institution
7) Other Rel. 8) Other ________________
(y) (n) 23. Has pt.'s living sitn. changed
due to vision impairment?

24. Referral Source:
1) News Media 2) Friend/family
3) Doctor 4) Other ______________________________
25. Referring Dr.: 1) OD 2) MD 3) Other ________________
26. Last seen by Eye Dr.: ________________
1) < 1 yr. 2) 1-5 yrs.
3) > 5 yrs. 4) Not sure
5) Never seen
27. Purpose of last visit:
1) Obtain/change Rx
2) Routine check
3) Emergency visit/injury
4) Other ____________________________
28. Patient's Eye Dr.:(name)
__________________________________ (25)
29. Eye Dr.'s address:(street)
__________________________________ (20)
30. Eye Dr.'s address:(city,st,zip/cntry)
____________________________________ (30)
31. Send report to:________________________________
32. Present Eye Dr.: | ___________________________
1) Does not know of clinic visit
2) Negative towards visit
3) Positive towards visit
4) Neutral towards visit
33. Present Eye Dr. gave pt. info about:
1) Low Vision 2) Voc. Renab.
3) Blind Rehab. (max=3)
34. Physician's name:
____________________________________ (25)
35. Physician's address:(street)
____________________________________ (25)
36. Physician's (city,st,zip/cntry)
____________________________________ (30)
37. When was last gen. physical exam?
1) < 1 yr. 2) 1-3 yrs.
3) 3-5 yrs. 4) > 5 yrs. 5) Never

II. VISUAL HISTORY

38. Onset of vis. loss: 1) Congen. 2) Rapid 3) Slow
39. Time since 1st vision loss:
1) < 6 mo. 2) 6 mo. - 1 yr.
3) 1 - 3 yrs. 4) 3 - 5 yrs.
5) > 5 yrs.
(y) (n) 40. Daily vision fluctuation?
(y) (n) 41. Is sunlight bothersome?
42. **Pt. expectations** of visual prognosis:
1) Eventual total blindness
2) Continued losses
3) Stability
4) Vision returning
5) Does not know
43. Patient's perception of eye problem:
____
____
____
____

44. Do you feel that one eye is
better than the other?
1) OD 2) OS 3) Same
45. Current Rx: 1) Helps 2) No diff. 3) N/A
46. Date Rx was last changed: ___/___/___
47. Who knows of visual impairment? (max=6)
1) Immediate family 2) Friends
3) General public 4) work supervisor
5) Co-workers 6) Teachers
48. Pt.'s visual self perception:
1) Blind 2) Sighted
3) Partially sighted
49. Prior contact through:
1) Organiz./group/assoc.
2) Family/friends 3) Dr.'s office 4) None

COMMENTS:_____________________________________
____
____

INTAKE : PAGE 2

III. GENERAL HEALTH

#87. Pt's perception of general health:

IV. EDUCATION

50. Formal education:
    - 00-12 yrs. in school PS) Pre-school
    - KG) Kindergarten HS) High school diploma
    - SC) Some college VT) Voc./Tech. school
    - CD) 4-yr. col degree SG) Some grad. school
    - GD) Graduate degree
    - Second two digits blank or IS for In School
51. Education:
    - 1) School w/no special services
    - 2) School w/vision services
    - 3) School for the blind
52. Reading method in school:
    - 1) Standard print 2) Large print
    - 3) Tape recorder 4) Braille

V. EMPLOYMENT

53. Pt's major occupation:
    - 1) Professional/managerial 2) Tech/skilled trade
    - 3) Semi-skilled/clerical 4) Unskilled
    - 5) Never employed
54. Vocational level:
    - 1) Professional/managerial
    - 2) Technical or skilled trade
    - 3) Semi-skilled/clerical
    - 4) Unskilled 5) Unemployed
55. Present employment status:
    - 1) Working part-time (< 30 hrs.)
    - 2) Working full time
    - 3) Student 4) Homemaker
    - 5) Retired 6) Unemployed

(y) (n) 56. Vocational problems?

57. Stopped working because of vision due to:
    - 1) Employer's suggestion 2) Dr.'s suggestion
    - 3) Self-initiated 4) Not vision related
58. Type of work desired:
    - 1) Same employment 2) Same type, diff. employer
    - 3) Anything available 4) New field of employment
    - 5) Not interested in working anymore

(y) (n) 59. Has pt. ever received voc. rehab. services?

60. Voc. rehab. services received:
    - 1) Currently 2) < 1 yr. ago
    - 3) < 2 yrs. ago 4) < 5 yrs. ago
    - 5) > 5yrs. ago
61. Primary source of financial support:
    - 1) Dividends, interest, rent or savings
    - 2) Family, friends
    - 3) Public assist. 4) Own earnings
    - 5) Social security 6) Other:____________________________
62. Types of voc. rehab. services being received:

VI. FUNCTIONAL INFORMATION

63. Smallest print pt. is able to see:
    (w/out spec. Rx)
    - 1) Headlines 2) Newsprint
    - 3) Sub-headlines 4) Phone book print
    - 5) Large print 6) Classified ads
64. (with spec. Rx)
    - 1) Headlines 2) Newsprint
    - 3) Sub-headlines 4) Phone book print
    - 5) Large print 6) Classified ads
65. Pt's preferred dist. for TV:
    - 1) < 3 ft. 2) 3 - 6 ft.
    - 3) 6 - 10 ft. 4) > 10 ft.
66. (C)olor (B)/W Screen size:______ in.
67. Can pt see facial detail at this dist.?
    (y) (n) (s)ome ____________________________
68. Can pt see facial detail if (s)he moves closer? (y) (n) (s)ome _____________
69. Daily living concerns (max=8)
    - 1) Grooming 2) Cooking
    - 3) Phoning 4) Eating
    - 5) Cleaning 6) Money managmnt
    - 7) Shopping 8) Sewing

(y) (n) 70. Can pt. use public transportation?

(y) (n) 71. Does pt. have access to public transportation?

VII. LOW VISION AIDS

73. Low vision aids in patient's possession: (types)
    - 1) Store-bought 2) Rx ____________________________
    - 3) Both 4) None ____________________________

(y) (n) 74. Did pt. receive training with aid(s)?

75. Pt. uses aid(s): (max=2)
    - 1) Frequently 2) Sometimes
    - 3) Rarely 4) No longer
    - 5) Never used

(y) (n) 76. Pt. uses aid(s) only in private?

(y) (n) 77. Previous low vision exam?

78. Date of last low vision exam: __ / __ / __

79. Last low vision exam performed by:
    (30)

72. Mobility concerns (max=8)
    - 1) Cross streets 2) Read signs
    - 3) Down steps 4) Up steps
    - 5) Crowd comfort 6) Sighted guide
    - 7) Public transprt 8) Light sensitive

INTAKE : PAGE 3

VIII. LEISURE ACTIVITIES

80. Interests

1) Arts & crafts 2) Gardening
3) Mechanics 4) Sports
5) Pleasure read 6) Pleasure write
7) Sew/knit/crcht 8) Other

IX. GOALS

81. Personal goals (in order of priority):

1) Reading 2) Mobility
3) Sew/knit/crcht 4) Educational
5) TV/movies/thtr 6) Daily living skills
7) Driving 8) Employment
9) Other: ______________________

:___/___/___/___/___/___/___/___/___

82. Priorities/special goals/comments

83. Other services presently being received

1) Voc. counseling 2) Voc. training
3) Ind. living skills 4) Homemaker care
5) Mobility instruct. 6) Counseling/support
7) Transportation 8) Shopping help
9) Readers Others: write in

X. GENERAL COMMENTS

84. Interviewer's initials: ________ 85.Punch Date: ___/___/___

86. AGMI responses:

/_/

FOLLOW-UP: ______________________________

9/23/82

WM. FEINBLOOM VISION REHABILITATION CNT
OPTOMETRIC DATA

1. ID/Record #:_______(6) 2. Last Name:__________________(13) 3. First Name:________________(11) 4. Exam date:__/__/__

MEDICAL HISTORY

Explain all diagnoses and list all medications to right in NOTES.

5. Previous Medical Diagnoses (max=3):
    1) Circulatory disorder
    2) Diabetes 3) Albinism
    4) Cerebral Palsy 5) Arthritis
    6) Rubella Synd. 7) CNS Dysf.
    8) Multiple Sclerosis
    9) Other ________________

Code as Dx # followed by age at Dx:
_________/_________/_________

6. Purpose of systemic medications (max=3):
    1) Blood pressure 2) Heart/Circ.
    3) Antibiotic 4) Diabetes
    5) Pain meds 6) Oral contrac.
    7) Antiinflamm/Arthritis
    8) Antidepress/tranquil/psych.
    9) Other: ________________

7. Previous Ocular Diagnoses (max=3):
    1) Cataract 2) Glaucoma
    3) Diabetic Retin. 4) Macular Degen.
    5) Squint/Strab. 6) Detached retina
    7) Retinitis Pigmentosa
    8) Eye infect/injury causing perm. visual loss
    9) Optic atrophy
    0) Other: ________________

(Code as #5) _________/_________/_________

8. Purpose of previous eye surgery (max=3):
    1) Cataract 2) IOL Implant
    3) Glaucoma 4) Squint/strab
    5) Retinal attach. 6) Corneal transplant
    7) Other: ________________

9. Purpose of current ocular medications (max=3):
    1) Glaucoma 2) Lubricant
    3) OTC decongest. 4) Infection
    5) Inflammation 6) Mydriasis
    7) Other: ________________

MEDICAL HISTORY NOTES

Family Medical History:________________

Allergies:________________

Drug Allergies:________________

Medication List:________________

CHIEF CONCERNS:

		DISTANCE		NEAR	
10-13. UNAIDED ACUITY		OD:_____/_____	OS:_____/_____	OD:_____/_____	OS:_____/_____
HABITUAL SPECTACLE Rx		Correction	Acuity	Correction	Acuity
14-17.	OD-	_____-_____X_____/_____	_____/_____	_____-_____X_____/_____	_____/_____
18-21.	OS-	_____-_____X_____/_____	_____/_____	_____-_____X_____/_____	_____/_____
22-25. Other Rx	OD-		_____/_____		_____/_____
26-29.	OS-		_____/_____		_____/_____
Aids Pt. Brght to WFVRC		Mfgr. / Power / Type	Acuity	Mfgr. / Power / Type	Acuity
30-37. AID #1	OD-	_____/_____/_____	_____/_____	_____/_____/_____	_____/_____
38-45.	OS-	_____/_____/_____	_____/_____	_____/_____/_____	_____/_____
46-53. AID #2	OD-	_____/_____/_____	_____/_____	_____/_____/_____	_____/_____
54-61.	OS-	_____/_____/_____	_____/_____	_____/_____/_____	_____/_____
62-69. AID #3	OD-	_____/_____/_____	_____/_____	_____/_____/_____	_____/_____
70-77.	OS-	_____/_____/_____	_____/_____	_____/_____/_____	_____/_____

WM. FEINBLOOM VISION REHABILITATION CNT
OPTOMETRIC DATA II

PRESENT VISUAL BEHAVIOR:

	DISTANCE	NEAR
78. Preferred work illum.:	(H)igh (A)verage (L)ow	79. (H)igh (A)verage (L)ow
80. Preferred lighting type:	1) Fluorescent 2) Incandescent 3) Sunlight 4) Other	81. 1) Fluorescent 2) Incandescent 3) Sunlight 4) Other
82. Binocularity:	(Y)es (N)o (U)ntested	83. (Y)es (N)o (U)ntested
84. **OD**: Eccentric viewing:	1) Up/left 2) Up 3) Up/right 4) Left 5) No EV 6) Right 7) Down/left 8) Down 9) Down/right	85. 1) Up/left 2) Up 3) Up/right 4) Left 5) No EV 6) Right 7) Down/left 8) Down 9) Down/right
86. **OS**: Eccentric viewing:	1) Up/left 2) Up 3) Up/right 4) Left 5) No EV 6) Right 7) Down/left 8) Down 9) Down/right	87. 1) Up/left 2) Up 3) Up/right 4) Left 5) No EV 6) Right 7) Down/left 8) Down 9) Down/right
88. Stable fixation:	(Y)es (N)o	89. (Y)es (N)o
90. Head turn:	1) None 2) Right 3) Left	91. 1) None 2) Right 3) Left
92. Head tilt:	1) None 2) Right 3) Left 4) Forward 5) Back	93. 1) None 2) Right 3) Left 4). Forward 5) Back
94. Compensatory head mvt?	(Y)es (N)o	95. (Y)es (N)o

VISUAL BEHAVIOR NOTES:

PD: __________

96-100. Distance subjective refraction (WFVRC):

97. OD: _______-_______X______/______

99. OS: _______-_______X______/______

96. Subjctv imprvmnt noted with WFVRC Rx? (Y) (N)

98. VA OD: ___/______

100. VA OS: ___/______ 101. VA OU: ___/______

LOW VISION AIDS ASSESSMENT:

INITIAL TRAINING PLAN:

O.D.: __________________ INTERN: __________________

			DISTANCE		NEAR	
TRIAL AIDS			Mfgr. / Power / Type	Acuity	Mfgr. / Power / Type	Acuity
102-109.	**AID #1**	OD-	________/________/________	_____/_____	________/________/________	_____/_____
110-117.		OS-	________/________/________	_____/_____	________/________/________	_____/_____
118-125.	**AID #2**	OD-	________/________/________	_____/_____	________/________/________	_____/_____
126-133.		OS-	________/________/________	_____/_____	________/________/________	_____/_____
134-141.	**AID #3**	OD-	________/________/________	_____/_____	________/________/________	_____/_____
142-149.		OS-	________/________/________	_____/_____	________/________/________	_____/_____

150. Patient loaned (#) _____ aids.

LOANED AIDS			Mfgr. / Power / Type	Acuity	Mfgr. / Power / Type	Acuity
151-158.	**AID #1**	OD-	________/________/________	_____/_____	________/________/________	_____/_____
159-166.		OS-	________/________/________	_____/_____	________/________/________	_____/_____
167-174.	**AID #2**	OD-	________/________/________	_____/_____	________/________/________	_____/_____
175-182.		OS-	________/________/________	_____/_____	________/________/________	_____/_____
183-190.	**AID #3**	OD-	________/________/________	_____/_____	________/________/________	_____/_____
191-198.		OS-	________/________/________	_____/_____	________/________/________	_____/_____

WM. FEINBLOOM VISION REHABILITATION CNT
OPTOMETRIC DATA III

NEXT VISIT CONCERNS:

OCULAR HEALTH:

199. Nystagmus:
    1) OD   2) OS
    3) OU   4) None

200. Null point of nystagmus:
    1) Up/left   2) Up   3) Up/right
    4) Left   5) No NP   6) Right
    7) Down/left   8) Down   9) Down/right

TONOMETRY :

201. OD: Instrument: 202. IOP=_____ mmHg.
    1) Goldmann   2) Schiøtz
    3) Mackay-Marg   4) NCT (Airpuff)
    5) Other   6) Not tested

203. OS: Instrument: 204. IOP=_____ mmHg.
    1) Goldmann   2) Schiøtz
    3) Mackay-Marg   4) NCT (Airpuff)
    5) Other   6) Not tested

VISUAL FIELDS:

205. Are there central or paracentral Scotomas present?
    1) OD   2) OS
    3) Both   4) Neither

206-7. Is there a field constriction to
10 degrees or less? (max=4)

206. OD: 1) No 2) Superior 3) Superior Nasal
4) Superior Temporal 5) Nasal 6) Temporal
7) Inferior Nasal 8) Inferior Temporal 9) Inferior

207. OS: 1) No 2) Superior 3) Superior Nasal
4) Superior Temporal 5) Nasal 6) Temporal
7) Inferior Nasal 8) Inferior Temporal 9) Inferior

208. Field Testing Device: (max=3)
    1) Perimeter   2) Tangent Screen
    3) Amsler Grid   4) Confrontation

209. OD Isopter _____/_______(target size(3)/distance(4)color(1)))
210. OS Isopter _____/_______(target size(3)/distance(4)color(1))

PATHOLOGY:

(N)one	(OD)	(OS)	(OU)	211. Lids
(N)one	(OD)	(OS)	(OU)	212. Cornea
(N)one	(OD)	(OS)	(OU)	213. Conj./Sclera
(N)one	(OD)	(OS)	(OU)	214. Ant. ch./Iris
(N)one	(OD)	(OS)	(OU)	215. Lens
(N)one	(OD)	(OS)	(OU)	216. Vitreous
(N)one	(OD)	(OS)	(OU)	217. Retina
(N)one	(OD)	(OS)	(OU)	218. Optic Nerve
(N)one	(OD)	(OS)	(OU)	219. Lat. Geniculate/Cortex

FINAL DIAGNOSES: (In order of importance)

	Dx	ICD-9 code	Eye
220.			R L B
221.			R L B
222.			R L B
223.			R L B
224.			R L B
225.			R L B
226.			R L B
227.			R L B
228.			R L B
229.			R L B

OCULAR HEALTH NOTES:

WM. FEINBLOOM VISION REHABILITATION CNT
OPTOMETRIC DATA IV

		DISTANCE		NEAR	
DISPENSED PRESCRIPTIONS		Correction	Acuity	Correction	Acuity
230-3. Spectacle Rx	OD-	______-______X______/______	_____/______	______-______X______/______	______/______
234-7.	OS-	______-______X______/______	_____/______	______-______X______/______	______/______
238-41.CL Rx	OD-	______________________________	_____/______	______________________________	______/______
242-5.	OS-	______________________________	_____/______	______________________________	______/______

246. Patient dispensed (#) _____ aids.

DISPENSED AIDS		Mfgr. / Power / Type	Acuity	Mfgr. / Power / Type	Acuity
247-254. **AID #1**	OD-	_________/_________/_________	_____/_____	_________/_________/_________	______/______
255-62.	OS-	_________/_________/_________	_____/_____	_________/_________/_________	______/______
263-70. **AID #2**	OD-	_________/_________/_________	_____/_____	_________/_________/_________	______/______
271-78.	OS-	_________/_________/_________	_____/_____	_________/_________/_________	______/______
279-86. **AID #3**	OD-	_________/_________/_________	_____/_____	_________/_________/_________	______/______
287-94.	OS-	_________/_________/_________	_____/_____	_________/_________/_________	______/______

SUN FILTERS: Codes for questions 295-297:

Sun filters Rx'ed:		Color of sun lenses:	
1) NoIR	2) Olo	1) Amber	2) Green
3) Corning	4) Slip-behind	3) Gray-green	4) Gray
5) Other	6) None	5) Yellow	6) Red

	TYPE	COLOR	% TRANSMISSION
295. Filter #1	_____	_____	_________
296. Filter #2	_____	_____	_________
297. Filter #3	_____	______________	

Date of Exam #1:____________
Date of Exam #2:____________
Date of Exam #3:____________
Date of Exam #4:____________
Date of Exam #5:____________
Date of Exam #6:____________

298. Date of FINAL Visit:____/____/____
299. Total # of Visits to WFVRC:____

300-304. Between first and last time seen at WFVRC significant changes were noted in:

(Y) (N) 300. Visual Acuity
(Y) (N) 301. Visual Fields
(Y) (N) 302. Ocular Health
(Y) (N) 303. Visual Functioning/Mobility
(Y) (N) 304. Psychosocial areas

305. Prognosis for reaching patient's stated goals:
(E)xcellent
(G)ood
(F)air
(P)oor

ADDITIONAL COMMENTS:

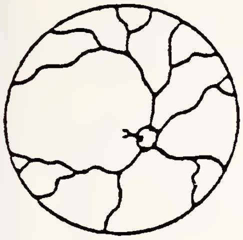
____________________________________ 306. OD:________________________________ 307. INTERN:____________________

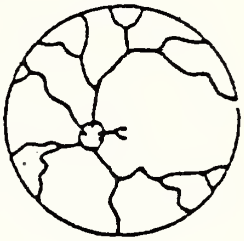
(Y) (N) 308. This patient needs individualized paragraph added to generated letter.

8/5/82

4 HEALTH EVALUATIONS:

Externals:





OD Media OS

Disc

__________ Cup/Disc H __________

__________ Cup/Disc V __________

__________ A/V Ratio __________

Vessels (HR, AS)

Venous Pulse

Macular Area

Foveal Reflex

Other

IOP __________

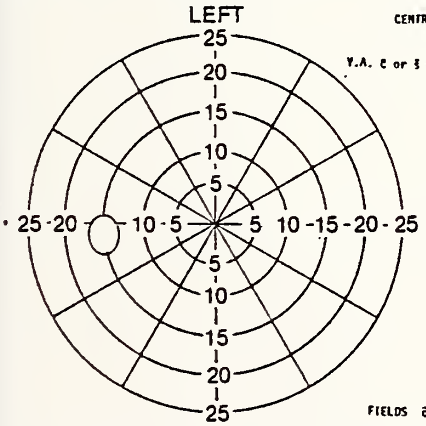
BP __________

DRUGS __________

( ) Direct Ophthalmoscopy ( ) Indirect Ophthalmoscopy ( ) Biomicroscopy

---

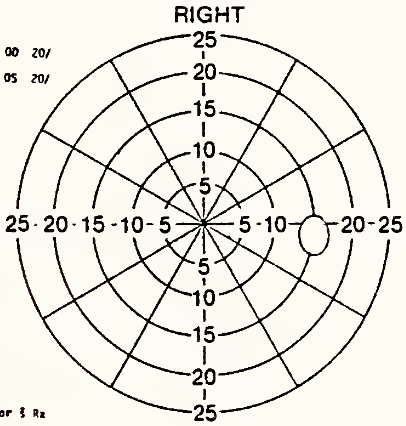
Date - Initial Exam



CENTRAL

V.A. c̄ or s̄ Rx OD 20/

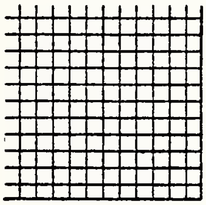
OS 20/



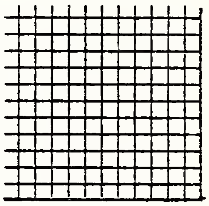
FIELDS c̄ or s̄ Rx

TARGET (Size, Color/Distance)

Amsler	Dist.

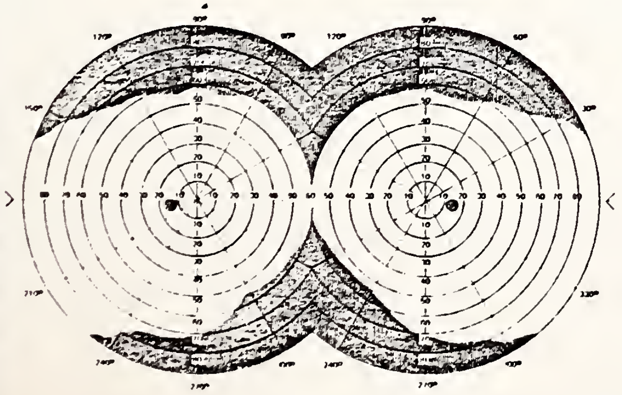


OS



OD

OS OD



Color Vision:

Keratrometry: OD

OS

SPECIAL TESTS

9. Eldx
11. Genetic
13. Social
15. Other
10. Dark Adp.
12. Psych.
14. Color

PHOTOGRAPHS

FINAL RX

Preceptee ____________________ Preceptor ____________________

IMPRESSIONS:

DATE ACTION

WILLIAM FEINBLOOM VISION REHABILITATION CENTER
FUNCTIONAL DATA

NEAR TRAINING FORM

Patient-Last Name:____________________________ First Name:____________________________

1. Preceptor:____________________________ 2. Preceptee:____________________________ 3. Date:___/___/___

Patient Reading History

4. Is patient currently able to read? (Y)es (N)o
5. Unable to read for _____ months _____ years
6. Size print read: (1) Reg. (2) Large (3) Braille (4) Tape
7. Material read: (1) Magazine (2) Newspaper (3) Mail (4) Correspondence (5) Other____________________
8. Reading assistance:
   (1) Someone reads to patient
   (2) Uses a mag/non-optical aid
   (3) No longer reads
9. Previous reading skills/preferences:
   (1) Pleasure reading
   (2) Read frequently
   (3) Read only when necessary

Patient Goals

(circle as many as apply)

10. Reading: (1) Newspaper/Magazines (2) Mail (3) School dittos (4) Bills (5) Phone #'s (6) Fic/Textbooks (7) Bible (8) Price tags (9) Recipes (10) Stock Market (11) Diagrams (12) Blueprints (13) Other____________________
11. Writing: (1) Sign name (2) Write letters (3) Checkbook (4) Fill out forms (5) Other____________________
12. Sewing: (1) Thread needle (2) Needlepoint (3) Knitting (4) Crocheting (5) Sewing Machine
13. Toolworking: (1) Screwdriver (2) Carving (3) Electronic (4) Hammer (5) Other____________________
14. Cooking: (1) Stove dials (2) Measurements (3) Mixing (4) See to cook (5) Other____________________
15. Card Playing: (1) Cards in hand (2) Cards on table
16. Phone Dialing: (1) Touch tone (2) Dial

Non-Optical Aids:____

____

Additional Training Needs:____

____

Aid Loaned:____

NOTES/COMENTS TO DOCTOR:

____

____

____

____

____

____

____

____

____

____

AIDS USED IN TRAINING

Description			Mfgr.	Power	Type	Prnt Size
	AID #1	17-20. OD-				
		21-24. OS-				
	AID #2	25-28. OD-				
		29-32. OS-				
	AID #3	33-36. OD-				
		37-40. OS-				

Directions: Check all behaviors which have been observed during the instructional period.

ALIGNMENT

AID # 1	2	3	PATIENT BEHAVIOR
___	___	___	41-43. Patient exhibits erratic head/eye movement
___	___	___	44-46. Patient verbalizes inability to see anything (black)
___	___	___	47-49. When scanning back to left margin patient can't find beginning of line—looks out of aid
___	___	___	50-52. Verbalizes inability to see anything clearly (things are foggy, smoky, dull, not clear)
___	___	___	53-55. Holds HH too far from eye
___	___	___	56-58. Verbalizes unsure whether looking through the aid

AID # 1	2	3	INSTRUCTOR BEHAVIOR
___	___	___	59-61. Holds patient's head.
___	___	___	62-64. Transfers material to reading stand
___	___	___	65-67. Uses typoscope
___	___	___	68-70. Drilled occluder (Bioptic)
___	___	___	71-73. Verbalizes need to go slow
___	___	___	74-76. Verbalizes problem as localizing
___	___	___	77-79. Provides eccentric viewing training
___	___	___	80-82. Uses penlight to check alignment
___	___	___	83-85. Manipulates P.D. and/or Pantoscopic tilt
___	___	___	86-88. Increases print size and spacing

FINDING FOCAL DISTANCE

AID # 1	2	3	PATIENT BEHAVIOR
___	___	___	89-91. Moves head/page quickly
___	___	___	92-94. Resists moving material close enough/complains about close working distance
___	___	___	95-97. Eye misaligned with center of lens
___	___	___	98-100. Physically changes distance from material to face after best focus is found
___	___	___	101-103. Eye moves out of optical center of lens
___	___	___	104-106. Verbalizes displeasure at reading at the proper (clearest) focal distance
___	___	___	107-109. Complains of blurring on ends of line

AID # 1	2	3	INSTRUCTOR BEHAVIOR
___	___	___	110-112. Measures distance
___	___	___	113-115. Moves material to correct focal distance
___	___	___	116-118. Has patient put material to nose then slowly move it out
___	___	___	119-121. Verbalizes problem
___	___	___	122-124. Physically assists
___	___	___	125-127. Verbalizes problem
___	___	___	128-130. Holds material for patient
___	___	___	131-133. Holds patient's head
___	___	___	134-136. Patient instructed to change distance slowly and observe what happens
___	___	___	137-139. Pipe cleaner attached to side of glasses

ECCENTRIC VIEWING INFORMATION

	PATIENT BEHAVIOR
(Y)es (N)o	140. Unaware of scotoma
OD____ OS____	141. Position of eccentric viewing (clockface: 1-12)
(Y)es (N)o	142. Stable fixation: (E)rratic
___ minutes	143. Length of time fixation maintained
(Y)es (N)o	144. Unable to read words longer than 3 letters
(Y)es (N)o	145. Unable to EV without target
(Y)es (N)o	146. Unable to move scotoma

	INSTRUCTOR BEHAVIOR
(Y)es (N)o	147. Asks which part of instr's face is clearest when moving scotoma in all quadrants
(Y)es (N)o	148. Pnt. instructed to compare best EV position on face with letter/word
(Y)es (N)o	149. Reminds pnt. which direction to move scotoma
(Y)es (N)o	150. Uses target to assist in positioning of scotoma
(Y)es (N)o	151. Uses typoscope
(Y)es (N)o	152. Uses pinhole patch
(Y)es (N)o	153. Increases magnification or print size

LOCALIZING/ SCANNING/ TRACING

AID # 1	2	3	PATIENT BEHAVIOR
___	___	___	154-156. Patient loses the line while reading
___	___	___	157-159. Loses word/place on line
___	___	___	160-162. Skips from line to line
___	___	___	163-165. Can't find left margin from right side
___	___	___	166-168. Loses place when moving to next line
___	___	___	169-171. Jumps form one word to another
___	___	___	172-174. Patient uses random large head movements
___	___	___	175-177. Erratic eye movements
___	___	___	178-180. Patient verbalizes inability to find line, words skip around
___	___	___	181-183. Patient doesn't read the whole line

AID # 1	2	3	INSTRUCTOR BEHAVIOR
___	___	___	184-186. Verbally assists patient by instructing to look more left, up, down, etc.
___	___	___	187-189. Typoscope used as a marker
___	___	___	190-192. Paper clip used as a marker
___	___	___	193-195. Pen used as a marker
___	___	___	196-198. Finger used as a marker
___	___	___	199-200. Verbalizes tracing line backwards technique
___	___	___	202-204. Verbalizes need to slow down
___	___	___	205-207. Has patient find and line up finger by looking thru carrier lens then lowering head to look thru telescope
___	___	___	208-210. Has patient trace line with finger to keep place

LETTER/WORD RECOGNITION

___	___	___	211-213. Patient spells word correctly but mispronounces
___	___	___	214-216. Word substitution (guessing)
___	___	___	217-219. "The words blend together"
___	___	___	220-222. Recognizes 2-3 letter words but not larger words

LIGHTING & DISTANCE PREFERENCE

223. Patient prefers light to be:(max=3)
(1) direct (2) indirect
(3) from left (4) from right
(5) behind shoulder (6) over head
224. Distance from page ______ inches
225. Distance from page ______ centimeters

PSYCHO-SOCIAL VARIABLES

226. Overall patient manner is:
(1) positive (2) negative
(3) can't tell, flat, matter of fact
227. Prognosis to attain goals with aids:
(1) Excellent
(2) Good
(3) Fair
(4) Guarded

228. Instructor manner is:
(1) positive (2) negative
(3) numb? can't tell?

Other Near Tasks:______________________________
Objective:______________________________ Date:___/___/___
Aids used (Optical & Non):______________________________
Performance: (Assistance) 1 2 3 4 5 (Independent)

COMMENTS

____
____
____
____
____
____
____
____

WILLIAM FEINBLOOM VISION REHABILITATION CENTER
FUNCTIONAL DATA

DISTANCE TRAINING FORM

Patient-Last Name:____________________ First Name:____________________

1. Preceptor:____________________ 2. Preceptee:____________________ 3. Date:___/___/___
4. Temp.:___Degrees Fahrenheit 5. Time of Day:___o'clock 6. Length of Session:___minutes

7. PATIENT GOALS (circle as many as apply)
(1) TV (2) Sports (3) Faces (4) Street Signs (5) Bus #'s (6) Blackboard
(7) Hunting (8) Theater (9) Movies (10) Driving (11) Other__________

AIDS USED IN TRAINING

Description			Mfgr.	Power	Type
	AID #1	8-10. OD-			
		11-13. OS-			
	AID #2	14-16. OD-			
		17-19. OS-			
	AID #3	20-22. OD-			
		23-25. OS-			

CONTINUUM OF TARGETS

AID # 1	2	3	Indoors
			26-28. TV
			29-31. Faces
			32-34. Clock
			35-37. Grand Rounds
			38-40. Optical Service
			41-43. Orientation Plaques
			44-46. TEI Staff Board
			47-49. Grocery store signs/items

AID # 1	2	3	Outdoors
			50-52. Street Signs
			53-55. TEI Signs
			56-58. License Plates
			59-61. Septa
			62-64. House #'s
			65-67. Gas Station Signs
			68-70. Traffic Lights
			71-73. Moving targets - cars, buses, walking people
			74-76. Riding in car as passenger

Absorptive lenses:____________________
Additional Training Needs:____________________

Aid Loaned:____________________
NOTES/COMMENTS TO DOCTOR:

PSYCHO-SOCIAL VARIABLES

77. Overall patient manner is:
(1) positive (2) negative
(3) can't tell, flat, matter of fact

78. Prognosis to attain goals with aids:
(1) Excellent
(2) Good
(3) Fair
(4) Guarded

79. Instructor manner is:
(1) positive (2) negative
(3) numb? can't tell?

WILLIAM FEINBLOOM VISION REHABILITATION CENTER
FUNCTIONAL DATA—PAGE 2—

Key words for deciding if practice is occurring are:
— PRACTICE, REVIEW, DRILL, & BREAKDOWN —

LOCALIZATION/SCANNING

AID # 1	AID # 2	AID # 3	PATIENT BEHAVIOR
___	___	___	80-82. Complains of target jumping
___	___	___	83-85. Patient exhibits random head/ telescope movement
___	___	___	86-88. Patient cannot find designated target
___	___	___	89-91. Patient cannot find any target
___	___	___	92-94. Patient cannot position telescope in front of eye

AID # 1	AID # 2	AID # 3	INSTRUCTOR BEHAVIOR
___	___	___	95-97. Arms are placed on table or supported against body
___	___	___	98-100. Lower power telescope is introduced
___	___	___	101-103. Holds patient's head/physically moves patient's head
___	___	___	104-106. Move to spectacle mounted scope
___	___	___	107-109. Use drilled occluder
___	___	___	110-112. Provide auditory cues
___	___	___	113-115. Instructor moves self to align with scope
___	___	___	116-118. Describes how scanning should occur
___	___	___	119-121. Uses chalkboard to have patient practice scanning
___	___	___	122-124. Practice scanning/use word

FOCUSING

AID # 1	AID # 2	AID # 3	PATIENT BEHAVIOR
___	___	___	125-127. Patient verbalizes that focusing does not charge image
___	___	___	128-130. Patient focuses only one eye on binocular system
___	___	___	131-137. Patient cannot get image as sharp as instructor

AID # 1	AID # 2	AID # 3	INSTRUCTOR BEHAVIOR
___	___	___	134-136. Instructor focuses for patient
___	___	___	137-139. Instructor finds best focus after patient has said seen best focus
___	___	___	140-142. Practice focusing
___	___	___	143-145. Recommends larger focus ring on a bioptic

TRACKING

AID # 1	AID # 2	AID # 3	PATIENT BEHAVIOR
___	___	___	146-148. Patient cannot visually follow moving targets through telescope

AID # 1	AID # 2	AID # 3	INSTRUCTOR BEHAVIOR
___	___	___	149-151. Instuctor has patient track people
___	___	___	152-154. Instructor has patient track cars
___	___	___	155-157. Practice tracking

COMMENTS

9/17/82

**Pennsylvania College
of Optometry
1200 West Godfrey Avenue
Philadelphia, Pa. 19141
215 424 5900**

The Eye Institute

1201 West Spencer Street
Philadelphia, Pa. 19141
215 276 6060

William Feinbloom
Vision Rehabilitation
Center

PATIENT INFORMATION RELEASE

IN THE INTEREST OF MY OWN EYE CARE, BOTH PRESENT AND FUTURE, I HEREBY GIVE MY CONSENT TO THE EYE INSTITUTE OF THE PENNSYLVANIA COLLEGE OF OPTOMETRY FOR THE RELEASE OF ANY OR ALL INFORMATION CONTAINED IN MY RECORDS, AS MAY BE REQUESTED BY THOSE ENGAGED IN MY CARE.

PATIENT SIGNATURE

PATIENT EDUCATIONAL RELEASE

I ACKNOWLEDGE MY WILLINGNESS TO HAVE SOUND/VIDEO/PHOTO REPRODUCTIONS OF MY EVLAUATIONS, EXAMINATIONS AND RECORDS PRODUCED FOR EDUCATIONAL PURPOSES AS THEY PERTAIN TO THE EDUCATIONAL AND POST-EDUCATIONAL PROGRAMS OF THE EYE INSTITUTE AND THE PENNSYLVANIA COLLEGE OF OPTOMETRY. THIS RELEASE IS OF PERPETUAL DURATION.

PATIENT SIGNATURE

THE EYE INSTITUTE OF THE PENNSYLVANIA COLLEGE OF OPTOMETRY

CONSENT AND RELEASE

I, ______________________________, having presented myself at The Eye Institute - Pennsylvania College of Optometry for examination and/or treatment, do voluntarily consent to the performance of examination, diagnostic procedures, and/or treatments as are deemed necessary or beneficial for my case. I understand that any of the above measures may be performed by an optometrist, ophthalmologist, other qualified specialist, or intern or technician under the supervision of either an optometrist, ophthalmologist, or qualified specialist. I further acknowledge that no guarantees have been made to me as to the effect of such procedures on my condition.

______________________________ ______________________________
Witness Patient

A.M.
P.M.
____
Date Time

Because the patient is unable to sign for the following reasons:

____
The above consent and release is given on the patient's behalf by:

______________________________ ______________________________
Witness Relative or Guardian

A.M.
P.M.
______________________________ ______________________________
Date Time Relationship

10/80 FORM PCO-63

PERSONAL INVENTORY

Directions:

The statements below have been used to describe how people see themselves or others. Please read each statement and circle the number to the right of the statement which indicates whether you agree or disagree with the statement. Answer each statement as it relates to how you view yourself.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. I have to push myself very hard to do anything	1	2	3	4	5
2. I feel self-confident	1	2	3	4	5
3. My family strongly supports my efforts to improve the use of my vision	1	2	3	4	5
4. I feel, I'll never enjoy things the way I use to	1	2	3	4	5
5. I feel helpless and don't expect change	1	2	3	4	5
6. I find myself getting upset over small, unimportant things	1	2	3	4	5
7. I feel that I have nothing to look forward to	1	2	3	4	5
8. My visual problems have not altered my relationships with family and/or friends	1	2	3	4	5

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
9. With practice and patience I can do jobs pretty well	1	2	3	4	5
10. I become tense and upset when I think about my present condition	1	2	3	4	5
11. I usually feel down in the dumps and without energy	1	2	3	4	5
12. I feel happy and content	1	2	3	4	5
13. A change in my visual abilities would probably cause difficulty	1	2	3	4	5
14. It means a lot for me to be able to support myself financially	1	2	3	4	5
15. My moods are unpredictable and often extreme	1	2	3	4	5
16. I am satisfied with most aspects of my life	1	2	3	4	5
17. I should not be expected to take care of myself	1	2	3	4	5
18. I often feel angry	1	2	3	4	5
19. My family relationships help keep me going	1	2	3	4	5
20. New things make me very anxious	1	2	3	4	5
21. People with disabilities like mine should not be expected to accomplish as much	1	2	3	4	5

GUIDE TO USING THE OPTOMETRIC FORM

Notes

The rationale behind using a new form at WFVRC is threefold:

- to make patient care more efficient by insuring that all data is accurate, complete, understandable and readily accessible to all WFVRC staff members
- to permit print out of letters to appropriate doctors and other referral sources on behalf of patient
- to be a resource for the clinical educational process in WFVRC
- to be a tool for longitudinal research leading to improved low vision patient care

This form has been designed to try to meet all of these needs, however compromise has been necessary on all three fronts. The data sheet serves not only as a patient record but also as a coding form for entry directly into the computer. It is important that all interns and staff understand the proper way of coding the information. This guide is meant to be a resource for questions about coding and interpretation of questions.

This form contains multiple choice questions whereas the previous WFVRC form was open-ended. This will take some getting used to and intelligent decisions must frequently be made about how to code data which does not fit into a given category. If the answer to a question is none, and that is not a choice, or if the question is not applicable for some reason, the question should be skipped and left blank. Anywhere in the questionnaire where a response of "Other" is possible, the information should be written in legibly.

This brings us to the first important point: that all information should be written down on the form whether or not it fits into the categories mentioned. The record must be complete, even if the computer data base may not be! All numbered questions will have information entered into the database. Unnumbered items will be for additional information.

ENTRIES SECTION

Notes

Please try to make all your entries legible so that computer entry is as accurate and painless as possible. Remember that both interns and staff O.D.'s names will be entered into the computer. Missing data is a definite drawback to the educational and research value of the data and will be directly traceable to you.
E1. Copy I.D. number carefully from patient file.

Q 1-4: IDENTIFICATION

Q1 - Copy I.D. number carefully from patient file.

Q2 - Print patient's last name--only 13 characters can be entered into the computer.

Q3 - Print patient's first name, preceded by Dr. if appropriate.

Q4 - Exam date-Code as 1st day seen for 4 day patients.

Q 5-9: MEDICAL HISTORY

Refer to the patient's previous medical history. You need not have a confirmed medical diagnosis to answer that a patient has a disease, e.g. "heart trouble" can be entered even when patient has never seen a physician who confirmed it. Any circulataory diagnosis must be clearly described in the MEDICAL HISTORY NOTES Section so that hypertension is distinguished from angina, etc. Each question under medical history can have a possible maximum of 3 different answers. For questions 6, 8, and 9 the appropriate numbers should be circled (up to 3 for each). Questions 5 and 7 must be coded underneath the question as the diagnosis code number (1 digit) followed by the age at which the diagnosis was made (2 digits). Do not use the number of years ago the diagnosis was made! For example, multiple sclerosis discovered at age 15 would be coded 815. If the age at diagnosis is unknown, code age as 99; if it is a congenital condition, code age as 00, e.g. albinism would be coded as 300. A patient with ocular diagnoses of cataract, diabetic retinopathy and detached retina would be coded 340|155|658, assuming the ages given are correct.

OTHER: MEDICAL HISTORY

Notes

Any answers which are "Other" in the Medical History Section must be coded as 9 with the correct age and the diagnosis should be written in. These will be analyzed periodically for consistent repeats and new diagnoses may be added to the coded database.

Q 10-29: ENTERING ACUITIES

These questions refer to the patient's entering acuities and corrections. Acuities should be written with the number right or wrong on a line written as a fraction over the possible number of letter or numbers on that line, instead of the usual designation of +2 or -3. For instance, 10/200+3 would be written as 10/200+3/5.

Corrections are written as sphere, followed by cylinder after the minus sign, followed by axis after the x, followed by the add after the /. Notice that all Rx's must be transposed into minus cylinder form.

Q 30-37: ENTERING AIDS

Low Vision aids appear in 3 other sections on the form. All these sections will be coded from the code sheet posted on the bulletin board in the conference room and taped to the desk in each exam room. This specifies each aid by manufacturer, power and type. If the information on manufacturer is unavailable on aids which the patient brought with them, it should be left blank. The attached comprehensive list of Distance and Near Optical aids should give you guidance in fitting Low Vision aids into the codes for Type. If you are at a total loss as to how the aid should be coded, write in as accurate a description as you can in pencil so that it can be coded correctly later.

Q 78-95: PRESENT VISUAL BEHAVIORS

These questions refer to a patient's present visual behavior at both distance and near. The proper answer should be circled and any explanatory information written in the "Notes" section. Be sure to take and record PD.

Notes

Q 96-101: SUBJECTIVE REFRACTIONS

This information comes from your subjective refraction during the initial exam. Static results and other intermediate information can be written in as needed. Ask the patient if s/he notes a different with this refraction as compared to his/her present Rx. This information is helpful in documenting the value of low vision aids versus conventional spectacles.

NOTE:

The "Low Vision Aids Assessment" and "Initial Training Plan" should be filled out with the help of your preceptor. Be sure to sign it and get the O.D. to initial.

Q 102-198: AIDS TRIED AND/OR LOANED

These questions refer to aids and acuities tried with and/or loaned to patients. They should be coded using the manufacturer, power, type aid information as in questions 30-77. For these questions manufactuer will always be known and should be entered. Treat problems with coding as in previous aid questions.

NOTE:

"Next Visit Concerns" should be written clearly since an intern may not be able to be present when the patient returns.

Q 199-200: NYSTAGMUS

These questions refer to nystagmus and are answered by circling the proper number.

Q 201-204: INSTRUMENTS & IDP

Both the type of instrument and the IOP must be entered for each eye.

Q 205-210: VISUAL FIELDS

Coding of the visual field information is taken from the plots done on the chart and requires a certain amount of attention to detail.

These questions will be answered affirmatively if scotomas are shown within the central 20 degrees.

Q 206-207 can have up to 4 codes entered, e.g. superior, superior nasal, superior temporal and nasal would have 2,3,4, and 5 all circled.

Q208-210 refer to the field testing device and 3 may be specified. The numbers after target size, distance and color refer to the number of digits, e.g. 010/1000w refers to a 10 mm white target used at 1 meter.

Q 211-219: PATHOLOGY

These questions are an overview of any areas of pathology. The proper designation should be circled in each case: none, OD, OS or OU.

Q 220-229: FINAL DIAGNOSIS

These questions should be decided upon at the last examination, checked with the preceptor, and written in legibly. In order of important to WFVRC means that ocular diagnoses should precede systemic. The ICD-9 codes will be added at a later date. Be sure, however, to circle R L or B to designate whether the Right, Left or Both eyes are affected.

OCULAR HEALTH NOTES

This section can be used for other detailed information about ocular health, pathology, etc.

Q 230-245: DISPENSED PRESCRIPTIONS

Dispensed prescriptions and acuities and should be entered as explained on the first page for entering acuities and corrections.

Q 246-294: DISPENSED AIDS

This is the most important aids sections and manufacturer, power and type must be specified for each, with respective acuities. This information is likely to be used for research purposes and should be double checked for accuracy. Be sure to write in the total number of aids dispensed, summing aids for distance and near. This will tell us if the patient purchased more than the 3 aids for distance and 3 aids for near that are coded on the form. Any other aid information can be written in under additional comments.

Q 295-297: SUNFILTERS

Record sun filters which may be dispensed. Type and color use the codes on the page; % transmission should be the two digit number, e.g. 80%.

Exam dates should be written in as they occur but only the initial and final exam dates will be entered into the computer.

Q 298-305: VISITS, CHANGES, PROGNOSIS

Q 298 should be filled out with two digits each for month, day and year. The total number of visits is entered in question 299. Since many patients are seen over a period of months, and significant changes can take place during this time, questions 300-304 identifying any areas which underwent a major change during the data collection. Finally, question 305 is a subjective assessment of the patient's ability to achieve his|her stated goals and should be a consensus of the intern, trainer, and O.D.

Q 306-307: INTERN|OD IDENTIFICATION

Q 306 and 307 should be written, last name, followed by first initial.

Q 308: LETTER INFORMATION

When the computerized letter for referral sources or selected eye care specialists is used, indicate in 308 if specialized or additional information will be needed on this patient.

CODES FOR LOW VISION AIDS--OPTOMETRIC FORM

manufacturer:

1) DVI
2) Walters
3) Selsi
4) American Optical
5) Bausch & Lomb
6) Coil
7) Keeler
8) Lucerne
9) Other

Power is 2 digits, followed by a decimal place and a decimal digit plus an x, e.g. 10.5x, 08.0x etc.

Type:

TELESCOPES:

1) Hand held telescope
2) Spectacle mounted Galilean telescope (Full-field)
3) Spectacle mounted Galilean telescope (Bioptic)
4) Spectacle mounted Keplerian telescope (Full-field)
5) Spectacle mounted Keplerian telescope (Bioptic)
6) Clip on Galilean telescope
7) Reverse telescope
8) Contact lens telescope system

NEAR AIDS:

9) Hand held magnifier
10) Illuminated hand held magnifier
11) Stand magnifier
12) Illuminated stand magnifier
13) Spectacle microscope (Full-field)/Half eye
14) Spectacle microscope-segmented or button bifocal
15) Head or spectacle mounted loupe
16) Telemicroscope (monocular)/cap for near use
17) Surgical telescope (binocular)
18) CCTV
19) Fresnel prism
20) Other
21) __(space_for_punched_info._on_Other

8/9/82

DATA ANALYSIS: GENERAL

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FREQUENCY OF RESPONSES TO AGE:


TOTAL RECORDED RESPONSES TO THIS ITEM:   447
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


LESS THAN 10                          50 TO 70
NUMBER OF CASES:   21                 NUMBER OF CASES:   99
PERCENTAGE:        4%                 PERCENTAGE:        22%

11 TO 19                              71 TO 83
NUMBER OF CASES:   29                 NUMBER OF CASES:   140
PERCENTAGE:        6%                 PERCENTAGE:        31%

20 TO 49                              84 TO 99
NUMBER OF CASES:   97                 NUMBER OF CASES:   61
PERCENTAGE:        21%                PERCENTAGE:        13%

 FREQUENCY OF RESPONSES TO SEX:


TOTAL RECORDED RESPONSES TO THIS ITEM:   463
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


MALE
NUMBER OF CASES:   287
PERCENTAGE:        61%

FEMALE
NUMBER OF CASES:   176
PERCENTAGE:        38%

FREQUENCY OF RESPONSES TO RACE:


TOTAL RECORDED RESPONSES TO THIS ITEM:   321
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


W
NUMLER OF CASES:   267                ASIAN
PERCENTAGE:        83%                NUMBER OF CASES:   3
                                      PERCENTAGE:        0%
BLACK
NUMBER OF CASES:   42                 NATIVE AMERICAN
PERCENTAGE:        13%                NUMBER OF CASES:   0
                                      PERCENTAGE:        0%

HISPANIC                              OTHER
NUMBER OF CASES:   8                  NUMBER OF CASES:   1
PERCENTAGE:        2%                 PERCENTAGE:        0%
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FREQUENCY OF RESPONSES TO MARITAL STATUS:


TOTAL RECORDED RESPONSES TO THIS ITEM:   453
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


MARRIED                                SEPARATED
NUMBER OF CASES:   213                 NUMBER OF CASES:   8
PERCENTAGE:        47%                 PERCENTAGE:        1%

WIDOWED                                NEVER MARRIED
NUMBER OF CASES:   109                 NUMBER OF CASES:   112
PERCENTAGE:        24%                 PERCENTAGE:        24%

DIVORCED
NUMBER OF CASES:   11
PERCENTAGE:        2%

FREQUENCY OF RESPONSES TO NUMBER OF DEPENDENTS:


TOTAL RECORDED RESPONSES TO THIS ITEM:   47
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


ONE                                    FOUR
NUMBER OF CASES:   15                  NUMBER OF CASES:   3
PERCENTAGE:        31%                 PERCENTAGE:        6%

TWO                                    FIVE
NUMBER OF CASES:   13                  NUMBER OF CASES:   4
PERCENTAGE:        27%                 PERCENTAGE:        8%

THREE                                  MORE THAN FIVE
NUMBER OF CASES:   11                  NUMBER OF CASES:   1
PERCENTAGE:        23%                 PERCENTAGE:        2%

FREQUENCY OF RESPONSES TO ONSET OF VISUAL LOSS:


TOTAL RECORDED RESPONSES TO THIS ITEM:   414
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


CONGENITAL                             SLOW
NUMBER OF CASES:   101                 NUMBER OF CASES:   224
PERCENTAGE:        24%                 PERCENTAGE:        54%

RAPID
NUMBER OF CASES:   89
PERCENTAGE:        21%
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FREQUENCY OF RESPONSES TO LIVING SITUATION:


TOTAL RECORDED RESPONSES TO THIS ITEM:   299
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


SPOUSE                                ALONE
NUMBER OF CASES:  126                 NUMBER OF CASES:  68
PERCENTAGE:       42%                 PERCENTAGE:       22%

CHILD                                 INSTITUTION
NUMBER OF CASES:  21                  NUMBER OF CASES:  3
PERCENTAGE:       7%                  PERCENTAGE:       1%

PARENTS                               OTHER RELATIVES
NUMBER OF CASES:  44                  NUMBER OF CASES:  13
PERCENTAGE:       14%                 PERCENTAGE:       4%

FRIENDS                               OTHER
NUMBER OF CASES:  11                  NUMBER OF CASES:  13
PERCENTAGE:       3%                  PERCENTAGE:       4%

FREQUENCY OF RESPONSES TO TIME SINCE FIRST VISION LOSS:


TOTAL RECORDED RESPONSES TO THIS ITEM:   424
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


LESS THAN SIX MONTHS                  THREE TO FIVE YEARS
NUMBER OF CASES:  9                   NUMBER OF CASES:  48
PERCENTAGE:       2%                  PERCENTAGE:       11%

SIX MONTHS TO ONE YEAR                MORE THAN FIVE YEARS
NUMBER OF CASES:  18                  NUMBER OF CASES:  279
PERCENTAGE:       4%                  PERCENTAGE:       65%

ONE TO THREE YEARS
NUMBER OF CASES:  70
PERCENTAGE:       16%

FREQUENCY OF RESPONSES TO DAILY VISION FLUCTUATION:


TOTAL RECORDED RESPONSES TO THIS ITEM:   361
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


YES                                   NO
NUMBER OF CASES:  173                 NUMBER OF CASES:  188
PERCENTAGE:       47%                 PERCENTAGE:       52%
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FREQUENCY OF RESPONSES TO PATIENT EXPECTATION OF VISUAL PROGNOSIS:


TOTAL RECORDED RESPONSES TO THIS ITEM:   267
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


EVENTUAL TOTAL BLINDESS             VISION RETURNING
NUMBER OF CASES:   8                NUMBER OF CASES:   6
PERCENTAGE:        2%               PERCENTAGE:        2%

CONTINUED LOSSES                    DOES NOT KNOW
NUMBER OF CASES:   45               NUMBER OF CASES:   131
PERCENTAGE:        16%              PERCENTAGE:        49%

STABILITY
NUMBER OF CASES:   77
PERCENTAGE:        28%



FREQUENCY OF RESPONSES TO PATIENT'S VISUAL SELF PERCEPTION:


TOTAL RECORDED RESPONSES TO THIS ITEM:   213
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


BLIND                               PARTIALLY SIGHTED
NUMBER OF CASES:   12               NUMBER OF CASES:   183
PERCENTAGE:        5%               PERCENTAGE:        85%

SIGHTED
NUMBER OF CASES:   18
PERCENTAGE:        8%



FREQUENCY OF RESPONSES TO EDUCATION TYPE:


TOTAL RECORDED RESPONSES TO THIS ITEM:   121
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


SCHOOL WITH NO SPECIAL SERVICES
NUMBER OF CASES:   81
PERCENTAGE:        66%

SCHOOL WITH VISION SERVICES          SCHOOL FOR THE BLIND
NUMBER OF CASES:   36                NUMBER OF CASES:   4
PERCENTAGE:        29%               PERCENTAGE:        3%
```

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FREQUENCY OF RESPONSES TO EDUCATION:


TOTAL RECORDED RESPONSES TO THIS ITEM:  245
TOTAL CLIENTS SURVEYED IN ANALYSIS:     471


PRE-SCHOOL                              VOC./TECH.SCHOOL
NUMBER OF CASES:   2                    NUMBER OF CASES:   20
PERCENTAGE:        0%                   PERCENTAGE:        8%

KINDERGARTEN                            4-YEAR COLLEGE DEGREE
NUMBER OF CASES:   1                    NUMBER OF CASES:   45
PERCENTAGE:        0%                   PERCENTAGE:        18%

HIGH SCHOOL DIPLOMA                     SOME GRADUATE SCHOOL
NUMBER OF CASES:   92                   NUMBER OF CASES:   2
PERCENTAGE:        37%                  PERCENTAGE:        0%

SOME COLLEGE                            GRADUATE DEGREE
NUMBER OF CASES:   50                   NUMBER OF CASES:   33
PERCENTAGE:        20%                  PERCENTAGE:        13%

FREQUENCY OF RESPONSES TO READING METHOD IN SCHOOL:


TOTAL RECORDED RESPONSES TO THIS ITEM:  116
TOTAL CLIENTS SURVEYED IN ANALYSIS:     471


STANDARD PRINT                          TAPE RECORDER
NUMBER OF CASES:   88                   NUMBER OF CASES:   5
PERCENTAGE:        75%                  PERCENTAGE:        4%

LARGE PRINT                             BRAILLE
NUMBER OF CASES:   20                   NUMBER OF CASES:   3
PERCENTAGE:        17%                  PERCENTAGE:        2%

FREQUENCY OF RESPONSES TO VOCATIONAL PROBLEMS:


TOTAL RECORDED RESPONSES TO THIS ITEM:  132
TOTAL CLIENTS SURVEYED IN ANALYSIS:     471


YES
NUMBER OF CASES:   79
PERCENTAGE:        59%

NO
NUMBER OF CASES:   53
PERCENTAGE:        40%
```

FREQUENCY OF RESPONSES TO PATIENT'S MAJOR OCCUPATION:

TOTAL RECORDED RESPONSES TO THIS ITEM: 395
TOTAL CLIENTS SURVEYED IN ANALYSIS: 471

PROFESSIONAL/MANAGERIAL
NUMBER OF CASES: 121
PERCENTAGE: 30%

TECH/SKILLED TRADE
NUMBER OF CASES: 91
PERCENTAGE: 23%

SEMI-SKILLED/CLERICAL
NUMBER OF CASES: 93
PERCENTAGE: 23%

UNSKILLED
NUMBER OF CASES: 55
PERCENTAGE: 13%

NEVER EMPLOYED
NUMBER OF CASES: 35
PERCENTAGE: 8%

FREQUENCY OF RESPONSES TO VOCATIONAL LEVEL:

TOTAL RECORDED RESPONSES TO THIS ITEM: 377
TOTAL CLIENTS SURVEYED IN ANALYSIS: 471

PROFESSIONAL/MANAGERIAL
NUMBER OF CASES: 117
PERCENTAGE: 31%

TECHNICAL OR SKILLED TRADE
NUMBER OF CASES: 76
PERCENTAGE: 20%

SEMI-SKILLED/CLERICAL
NUMBER OF CASES: 87
PERCENTAGE: 23%

UNSKILLED
NUMBER OF CASES: 75
PERCENTAGE: 19%

UNEMPLOYED
NUMBER OF CASES: 22
PERCENTAGE: 5%

FREQUENCY OF RESPONSES TO STOPPED WORKING (VISION) DUE TO:

TOTAL RECORDED RESPONSES TO THIS ITEM: 154
TOTAL CLIENTS SURVEYED IN ANALYSIS: 471

EMPLOYER'S SUGGESTION
NUMBER OF CASES: 7
PERCENTAGE: 4%

DR.'S SUGGESTION
NUMBER OF CASES: 3
PERCENTAGE: 1%

SELF-INITIATED
NUMBER OF CASES: 67
PERCENTAGE: 43%

NOT VISION RELATED
NUMBER OF CASES: 77
PERCENTAGE: 50%

FREQUENCY OF RESPONSES TO PRESENT EMPLOYMENT STATUS:

TOTAL RECORDED RESPONSES TO THIS ITEM: 407
TOTAL CLIENTS SURVEYED IN ANALYSIS: 471

WORKING PART-TIME (<30 HRS)
NUMBER OF CASES: 30
PERCENTAGE: 7%

WORKING FULL-TIME
NUMBER OF CASES: 74
PERCENTAGE: 18%

STUDENT
NUMBER OF CASES: 34
PERCENTAGE: 8%

HOMEMAKER
NUMBER OF CASES: 25
PERCENTAGE: 6%

RETIRED
NUMBER OF CASES: 191
PERCENTAGE: 46%

UNEMPLOYED
NUMBER OF CASES: 53
PERCENTAGE: 13%

FREQUENCY OF RESPONSES TO PRIME DAILY LIVING CONCERN:

TOTAL RECORDED RESPONSES TO THIS ITEM: 135
TOTAL CLIENTS SURVEYED IN ANALYSIS: 471

GROOMING
NUMBER OF CASES: 36
PERCENTAGE: 26%

COOKING
NUMBER OF CASES: 31
PERCENTAGE: 22%

PHONING
NUMBER OF CASES: 10
PERCENTAGE: 7%

EATING
NUMBER OF CASES: 12
PERCENTAGE: 8%

CLEANING
NUMBER OF CASES: 5
PERCENTAGE: 3%

MONEY MANAGEMENT
NUMBER OF CASES: 20
PERCENTAGE: 14%

SHOPPING
NUMBER OF CASES: 11
PERCENTAGE: 8%

SEWING
NUMBER OF CASES: 10
PERCENTAGE: 7%

```
FREQUENCY OF RESPONSES TO PRIME PERSONAL GOAL:


TOTAL RECORDED RESPONSES TO THIS ITEM:   455
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


READING                                DAILY LIVING SKILLS
NUMBER OF CASES:   347                 NUMBER OF CASES:   13
PERCENTAGE:        76%                 PERCENTAGE:         2%

MOBILITY                               DRIVING
NUMBER OF CASES:   16                  NUMBER OF CASES:   22
PERCENTAGE:        3%                  PERCENTAGE:         4%

SEW/KNIT/CRCHT                         EMPLOYMENT
NUMBER OF CASES:   5                   NUMBER OF CASES:   7
PERCENTAGE:        1%                  PERCENTAGE:        1%

EDUCATIONAL                            OTHER
NUMBER OF CASES:   9                   NUMBER OF CASES:   20
PERCENTAGE:        1%                  PERCENTAGE:        4%

TV/MOVIES/THTR
NUMBER OF CASES:   16
PERCENTAGE:        3%



FREQUENCY OF RESPONSES TO LEISURE ACTIVITIES - INTERESTS:


TOTAL RECORDED RESPONSES TO THIS ITEM:   442
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


ARTS & CRAFTS                          PLEASURE READING
NUMBER OF CASES:   32                  NUMBER OF CASES:   79
PERCENTAGE:        7%                  PERCENTAGE:        17%

GARDENING                              PLEASURE WRITING
NUMBER OF CASES:   54                  NUMBER OF CASES:   4
PERCENTAGE:        12%                 PERCENTAGE:        0%

MECHANICS                              SEW/KNIT/CROCHET
NUMBER OF CASES:   17                  NUMBER OF CASES:   22
PERCENTAGE:        3%                  PERCENTAGE:        4%

SPORTS                                 OTHER
NUMBER OF CASES:   108                 NUMBER OF CASES:   126
PERCENTAGE:        24%                 PERCENTAGE:        28%
```

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FREQUENCY OF RESPONSES TO SMALLEST PRINT WITHOUT SPEC. RX:

TOTAL RECORDED RESPONSES TO THIS ITEM:  319
TOTAL CLIENTS SURVEYED IN ANALYSIS:     471

HEADLINES                            PHONE BOOK PRINT
NUMBER OF CASES:  202                NUMBER OF CASES:  10
PERCENTAGE:       63%                PERCENTAGE:       3%

NEWSPRINT                            LARGE PRINT
NUMBER OF CASES:  41                 NUMBER OF CASES:  32
PERCENTAGE:       12%                PERCENTAGE:       10%

SUB-HEADLINES                        CLASSIFIED ADS
NUMBER OF CASES:  32                 NUMBER OF CASES:  2
PERCENTAGE:       10%                PERCENTAGE:       0%


FREQUENCY OF RESPONSES TO SMALLEST PRINT WITH SPEC. RX:

TOTAL RECORDED RESPONSES TO THIS ITEM:  348
TOTAL CLIENTS SURVEYED IN ANALYSIS:     471

HEADLINES                            PHONE BOOK PRINT
NUMBER OF CASES:  98                 NUMBER OF CASES:  19
PERCENTAGE:       28%                PERCENTAGE:       5%

NEWSPRINT                            LARGE PRINT
NUMBER OF CASES:  136                NUMBER OF CASES:  52
PERCENTAGE:       39%                PERCENTAGE:       14%

SUB-HEADLINES                        CLASSIFIED ADS
NUMBER OF CASES:  35                 NUMBER OF CASES:  8
PERCENTAGE:       10%                PERCENTAGE:       2%
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FREQUENCY OF RESPONSES TO PRIME MOBILITY CONCERNS:


TOTAL RECORDED RESPONSES TO THIS ITEM:   263
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


                                       CROWD COMFORT
CROSS STREETS                          NUMBER OF CASES:   3
NUMBER OF CASES:  111                  PERCENTAGE:        1%
PERCENTAGE:       42%

                                       SIGHTED GUIDE
READ SIGNS                             NUMBER OF CASES:   3
NUMBER OF CASES:  59                   PERCENTAGE:        1%
PERCENTAGE:       22%

                                       PUBLIC TRANSPORTATION
DOWN STEPS                             NUMBER OF CASES:   3
NUMBER OF CASES:  66                   PERCENTAGE:        1%
PERCENTAGE:       25%

                                       LIGHT SENSITIVITY
UP STEPS                               NUMBER OF CASES:   16
NUMBER OF CASES:  2                    PERCENTAGE:        6%
PERCENTAGE:       0%




FREQUENCY OF RESPONSES TO PRIMARY SOURCE OF FINANCIAL SUPPORT:


TOTAL RECORDED RESPONSES TO THIS ITEM:   127
TOTAL CLIENTS SURVEYED IN ANALYSIS:      471


DIVIDENDS-SAVINGS-RENT                 OWN EARNINGS
NUMBER OF CASES:  11                   NUMBER OF CASES:   19
PERCENTAGE:       8%                   PERCENTAGE:        14%

FAMILY-FRIENDS                         SOCIAL SECURITY
NUMBER OF CASES:  23                   NUMBER OF CASES:   54
PERCENTAGE:       18%                  PERCENTAGE:        42%

PUBLIC ASSISTANCE                      OTHER
NUMBER OF CASES:  1                    NUMBER OF CASES:   19
PERCENTAGE:       0%                   PERCENTAGE:        14%
```

PERSONAL INVENTORY
(AGMI) - INTAKE CORRELATES

Item (Pesponses/Population)	Distribution by %	Personal Inventory (AGMI)
AGE (447/471)		
Less than 10	4%	less than 21
11 19	6%	76.4
20 49	21%	Between 21 & 70
50 70	22%	74.9
71 83	31%	74.3
84 99	13%	71.2
SEX (463/471)		
Male	61%	75.0
Female	38%	73.6
RACE (321/471)		
White	83%	74.8
Black	13%	69.8
Hispanic	2%	79.0
Other	0	0
MARITAL STATUS (453/471)		
Married	47%	76.3
Widowed	24%	0
Divorced	2%	0
Separated	1%	0
Never Married	24%	70.7
EDUCATIONAL LEVEL (245/471)		
Preschool	0	0
1-4 Kindergarten	0	
High School Diploma	37%	75.2
Some College	20%	77.7
Voc/Tech School	8%	70.0
4-Year College Degree	18%	77.7
Some Graduate School	0	0
Graduate Degree	13%	77.0

	Distribution by %	AGMI
EMPLOYMENT STATUS (407-471)		
Working part-time	7%	71.3
Working full-time	18%	81.2
Unemployed	13%	73.4
Retired	46%	74.0
Student	8%	69.0
Homemaker	6%	57.0
FINANCIAL STATUS (127/471)		
Dividends/Savings/Rent	8%	75.6
Family/FriendsL	18%	76.6
Public Assistance	0	0
Own Earnings	14%	80.1
Social Security	42%	73.6
Other	14%	67.2
LIVING SITUATIONS (299/471)		
With Spouse	42%	76.5
With Children	7%	69.5
With Parents	14%	75.6
With Friends	3%	78.3
Alone	22%	71.5
Institution	1%	0
Other Relatives	4%	76.6
Other	4%	69.0
CHANGE IN LIVING SITUATION (361/471)		
Yes	47%	69
No	52%	73.4
ONSET OF VISUAL LOSS (414/471)		
Congenital	24%	75.0
Rapid	21%	74.2
Slow	54%	74.2
TIME SINCE LOSS VISION (424/471)		
0-6 Months	2%	68.5
6 Mos.-1 Yr.	4%	71.0
1-3 Years	16%	72.9
3-5 Years	11%	74.4
5+ Years	65%	75.7

	Distribution by %	AGMI
FLUCTUATING VISION (361/471)		
Yes	47%	
No	52%	
PT'S. VIEWS VISUAL PROGRNOSIS (267/471)		
Become Totally Blind	2%	76.0
Continued Loss	16%	73.2
Stability	28%	75.3
Vision Returning	2%	86.5
Does Not Know	49%	72.3
PT'S. VISUAL SELF PERCEPTION (213/471)		
Blind	5%	78.0
Sighted	8%	76.8
Partial	85%	73.9
STOPPED WORK DUE TO VISION (154/471)		
Employers' Suggestion	4%	
Doctors' Suggestion	1%	
Self-Initiated	43%	
Not Vision Related	50%	

PERSONAL INVENTORY(AGMI) &
INTAKE FACTOR ANALYSIS

Factor 1: Negative Self-concept

1-I have to push myself very hard to do anything.
4-I feel, I'll never enjoy things the way I use to.
5-I feel helpless and don't expect change.
7-I feel that I have nothing to look forward to.
10-I become tense and upset when I think about my present condition.

Factor 2: Family Support

3-My family strongly supports my efforts to improve the use of my vision.
19-My family relationships help keeping me going.

Factor 3: Positive Attitudes

2-I feel self confident.
14-It means a lot for me to support myself financially.
16-I am satisfied with most aspects of my life.

Factor 4: Emotional Stability

8-My visual problems have not altered my relationships with family or friends.
11-I usually feel down in the dumps and without energy.
18-I often feel angry.

Factor 5: Mood

6-I find myself getting upset over small unimportant things.
15-My moods are unpredictable and often extreme.

```
AGMI AS RELATED TO SEX OF RESPONDANT


MALE
NUMBER OF CASES:  31
AVERAGE AGMI:  75.0968
FACTOR 1:       15.3686  (Z =    0.1210)
FACTOR 2:        6.4042  (Z =   -0.0473)
FACTOR 3:        7.8273  (Z =    0.2455)
FACTOR 4:        4.0757  (Z =   -0.0273)
FACTOR 5:        4.0824  (Z =    0.0545)

FEMALE
NUMBER OF CASES:  30
AVERAGE AGMI:  73.6667
FACTOR 1:       14.6505  (Z =   -0.1283)
FACTOR 2:        6.5342  (Z =    0.0462)
FACTOR 3:        7.2470  (Z =   -0.2504)
FACTOR 4:        4.1290  (Z =    0.0326)
FACTOR 5:        3.9851  (Z =   -0.0468)



AGMI AS RELATED TO COMMUNITY TYPE OF RESPONDANT


URBAN
NUMBER OF CASES:  22
AVERAGE AGMI:  73.5455
FACTOR 1:       14.4241  (Z =   -0.2069)
FACTOR 2:        6.3018  (Z =   -0.1210)
FACTOR 3:        7.5516  (Z =    0.0099)
FACTOR 4:        3.9420  (Z =   -0.1775)
FACTOR 5:        4.1239  (Z =    0.0978)

SUBURBAN
NUMBER OF CASES:  23
AVERAGE AGMI:  75.3043
FACTOR 1:       15.6515  (Z =    0.2193)
FACTOR 2:        6.6461  (Z =    0.1267)
FACTOR 3:        7.4859  (Z =   -0.0463)
FACTOR 4:        4.2882  (Z =    0.2114)
FACTOR 5:        3.8683  (Z =   -0.1684)

RURAL
NUMBER OF CASES:  7
AVERAGE AGMI:  73.5714
FACTOR 1:       14.6060  (Z =   -0.1437)
FACTOR 2:        6.6407  (Z =    0.1228)
FACTOR 3:        7.2139  (Z =   -0.2787)
FACTOR 4:        4.3246  (Z =    0.2524)
FACTOR 5:        3.8667  (Z =   -0.1701)
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AGMI AS RELATED TO RACE OF RESPONDANT


WHITE
NUMBER OF CASES:  54
AVERAGE AGMI:  74.8333
FACTOR 1:       15.2984  (Z =    0.0967)
FACTOR 2:        6.5235  (Z =    0.0385)
FACTOR 3:        7.4872  (Z =   -0.0452)
FACTOR 4:        4.1433  (Z =    0.0486)
FACTOR 5:        4.0840  (Z =    0.0562)

BLACK
NUMBER OF CASES:  5
AVERAGE AGMI:  69.8000
FACTOR 1:       11.9254  (Z =   -1.0745)
FACTOR 2:        6.4152  (Z =   -0.0394)
FACTOR 3:        8.1566  (Z =    0.5270)
FACTOR 4:        3.5608  (Z =   -0.6059)
FACTOR 5:        3.4096  (Z =   -0.6462)

HISPANIC
NUMBER OF CASES:  1
AVERAGE AGMI:  79.0000
FACTOR 1:       16.7089  (Z =    0.5864)
FACTOR 2:        5.0745  (Z =   -1.0040)
FACTOR 3:        6.8000  (Z =   -0.6325)
FACTOR 4:        4.6573  (Z =    0.6262)
FACTOR 5:        5.0116  (Z =    1.0225)

ASIAN
NUMBER OF CASES:  0

NATIVE AMERICAN
NUMBER OF CASES:  0

OTHER
NUMBER OF CASES:  0
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AGMI AS RELATED TO MARITAL STATUS OF RESPONDANT


MARRIED
NUMBER OF CASES:  27
AVERAGE AGMI:  76.3704
FACTOR 1:       15.4702  (Z =    0.1563)
FACTOR 2:        7.0119  (Z =    0.3899)
FACTOR 3:        7.6364  (Z =    0.0824)
FACTOR 4:        4.1398  (Z =    0.0447)
FACTOR 5:        4.1211  (Z =    0.0949)

WIDOWED
NUMBER OF CASES:  17
AVERAGE AGMI:  70.7059
FACTOR 1:       13.1313  (Z =   -0.6558)
FACTOR 2:        6.2648  (Z =   -0.1476)
FACTOR 3:        7.2518  (Z =   -0.2463)
FACTOR 4:        3.9681  (Z =   -0.1483)
FACTOR 5:        4.2018  (Z =    0.1789)

DIVORCED
NUMBER OF CASES:  0

SEPARATED
NUMBER OF CASES:  0

NEVER MARRIED
NUMBER OF CASES:  17
AVERAGE AGMI:  74.9412
FACTOR 1:       16.1772  (Z =    0.4018)
FACTOR 2:        5.8079  (Z =   -0.4764)
FACTOR 3:        7.6818  (Z =    0.1212)
FACTOR 4:        4.1755  (Z =    0.0849)
FACTOR 5:        3.7298  (Z =   -0.3128)




AGMI AS RELATED TO NUMBER OF DEPENDENTS OF RESPONDANT


ONE                                FOUR
NUMBER OF CASES:  0                NUMBER OF CASES:  0

TWO                                FIVE
NUMBER OF CASES:  0                NUMBER OF CASES:  0

THREE                              SIX
NUMBER OF CASES:  0                NUMBER OF CASES:  0
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AGMI AS RELATED TO LIVING SITUATION OF RESPONDANT

SPOUSE
NUMBER OF CASES:   26
AVERAGE AGMI:   76.5385
FACTOR 1:       15.4850  (Z =    0.1614)
FACTOR 2:        6.9901  (Z =    0.3741)
FACTOR 3:        7.7233  (Z =    0.1567)
FACTOR 4:        4.2340  (Z =    0.1506)
FACTOR 5:        4.0869  (Z =    0.0592)

CHILD
NUMBER OF CASES:   2
AVERAGE AGMI:   69.5000
FACTOR 1:       12.3734  (Z =   -0.9189)
FACTOR 2:        5.9514  (Z =   -0.3731)
FACTOR 3:        8.1650  (Z =    0.5342)
FACTOR 4:        3.8123  (Z =   -0.3233)
FACTOR 5:        3.5100  (Z =   -0.5416)

PARENTS
NUMBER OF CASES:   5
AVERAGE AGMI:   75.6000
FACTOR 1:       16.2703  (Z =    0.4341)
FACTOR 2:        6.9289  (Z =    0.3301)
FACTOR 3:        7.2368  (Z =   -0.2592)
FACTOR 4:        4.2967  (Z =    0.2210)
FACTOR 5:        3.5588  (Z =   -0.4908)

FRIENDS
NUMBER OF CASES:   3
AVERAGE AGMI:   78.3333
FACTOR 1:       17.5971  (Z =    0.8948)
FACTOR 2:        4.4898  (Z =   -1.4246)
FACTOR 3:        7.9117  (Z =    0.3177)
FACTOR 4:        4.5819  (Z =    0.5415)
FACTOR 5:        4.0935  (Z =    0.0661)

ALONE
NUMBER OF CASES:   18
AVERAGE AGMI:   71.5000
FACTOR 1:       13.6922  (Z =   -0.4611)
FACTOR 2:        6.0038  (Z =   -0.3354)
FACTOR 3:        7.2940  (Z =   -0.2103)
FACTOR 4:        4.0355  (Z =   -0.0724)
FACTOR 5:        4.2468  (Z =    0.2258)

INSTITUTIONS
NUMBER OF CASES:   0
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OTHER REL.
NUMBER OF CASES:  3
AVERAGE AGMI:  76.6667
FACTOR 1:       16.2922   (Z =    0.4417)
FACTOR 2:        6.2021   (Z =   -0.1927)
FACTOR 3:        8.1650   (Z =    0.5342)
FACTOR 4:        3.8057   (Z =   -0.3306)
FACTOR 5:        3.6758   (Z =   -0.3689)

OTHER
NUMBER OF CASES:  3
AVERAGE AGMI:  69.0000
FACTOR 1:       14.6730   (Z =   -0.1205)
FACTOR 2:        6.1813   (Z =   -0.2077)
FACTOR 3:        7.2788   (Z =   -0.2233)
FACTOR 4:        3.8434   (Z =   -0.2883)
FACTOR 5:        3.4240   (Z =   -0.6313)



AGMI AS RELATED TO NUMBER OF DEFENDENTS OF RESPONDANT


ONE
NUMBER OF CASES:  2
AVERAGE AGMI:  81.5000
FACTOR 1:       16.4913   (Z =    0.5109)
FACTOR 2:        8.0190   (Z =    1.1144)
FACTOR 3:        8.5031   (Z =    0.8232)
FACTOR 4:        4.6573   (Z =    0.6262)
FACTOR 5:        5.0116   (Z =    1.0225)

FOUR
NUMBER OF CASES:  1
AVERAGE AGMI:  82.0000
FACTOR 1:       17.4328   (Z =    0.8378)
FACTOR 2:        6.7660   (Z =    0.2129)
FACTOR 3:        8.1650   (Z =    0.5342)
FACTOR 4:        4.6573   (Z =    0.6262)
FACTOR 5:        5.0116   (Z =    1.0225)

FIVE                                      TWO
NUMBER OF CASES:  0                       NUMBER OF CASES:  0

SIX                                       THREE
NUMBER OF CASES:  1                       NUMBER OF CASES:  0
AVERAGE AGMI:  73.0000
FACTOR 1:       14.9965   (Z =   -0.0082)
FACTOR 2:        7.5805   (Z =    0.7989)
FACTOR 3:        8.1650   (Z =    0.5342)
FACTOR 4:        4.0186   (Z =   -0.0914)
FACTOR 5:        2.5058   (Z =   -1.5877)
```

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AGMI AS RELATED TO ONSET OF VISUAL LOSS OF RESPONDANT


CONGENITAL
NUMBER OF CASES:   9
AVERAGE AGMI:  75.0000
FACTOR 1:      16.5874   (Z =    0.5442)
FACTOR 2:       5.8054   (Z =   -0.4781)
FACTOR 3:       7.3381   (Z =   -0.1726)
FACTOR 4:       4.4318   (Z =    0.3729)
FACTOR 5:       3.6477   (Z =   -0.3983)

RAPID
NUMBER OF CASES:  14
AVERAGE AGMI:  74.2857
FACTOR 1:      14.7177   (Z =   -0.1050)
FACTOR 2:       6.4035   (Z =   -0.0478)
FACTOR 3:       7.4321   (Z =   -0.0922)
FACTOR 4:       4.3408   (Z =    0.2705)
FACTOR 5:       3.9206   (Z =   -0.1139)

SLOW
NUMBER OF CASES:  38
AVERAGE AGMI:  74.2895
FACTOR 1:      14.7528   (Z =   -0.0928)
FACTOR 2:       6.6489   (Z =    0.1287)
FACTOR 3:       7.6306   (Z =    0.0774)
FACTOR 4:       3.9358   (Z =   -0.1845)
FACTOR 5:       4.1681   (Z =    0.1439)
```

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AGMI AS RELATED TO TIME SINCE FIRST VISION LOSS OF RESPONDANT


LESS THAN SIX MONTHS
NUMBER OF CASES:  2
AVERAGE AGMI:   68.5000
FACTOR 1:       13.1499  (Z =   -0.6494)
FACTOR 2:        6.3587  (Z =   -0.0801)
FACTOR 3:        6.8000  (Z =   -0.6325)
FACTOR 4:        2.9673  (Z =   -1.2727)
FACTOR 5:        4.2608  (Z =    0.2405)

SIX MONTHS TO ONE YEAR
NUMBER OF CASES:  1
AVERAGE AGMI:   71.0000
FACTOR 1:       12.1019  (Z =   -1.0132)
FACTOR 2:        6.7660  (Z =    0.2129)
FACTOR 3:        8.1650  (Z =    0.5342)
FACTOR 4:        4.6573  (Z =    0.6262)
FACTOR 5:        3.5100  (Z =   -0.5416)

ONE TO THREE YEARS
NUMBER OF CASES:  16
AVERAGE AGMI:   72.9375
FACTOR 1:       14.0373  (Z =   -0.3412)
FACTOR 2:        6.9109  (Z =    0.3172)
FACTOR 3:        7.2819  (Z =   -0.2206)
FACTOR 4:        4.0822  (Z =   -0.0200)
FACTOR 5:        4.0409  (Z =    0.0113)

THREE TO FIVE YEARS
NUMBER OF CASES:  9
AVERAGE AGMI:   74.4444
FACTOR 1:       14.9466  (Z =   -0.0255)
FACTOR 2:        6.5850  (Z =    0.0827)
FACTOR 3:        7.4990  (Z =   -0.0350)
FACTOR 4:        3.9395  (Z =   -0.1804)
FACTOR 5:        4.3714  (Z =    0.3556)

MORE THAN FIVE YEARS
NUMBER OF CASES:  29
AVERAGE AGMI:   75.7931
FACTOR 1:       15.8739  (Z =    0.2965)
FACTOR 2:        6.1460  (Z =   -0.2331)
FACTOR 3:        7.6661  (Z =    0.1078)
FACTOR 4:        4.2221  (Z =    0.1372)
FACTOR 5:        3.9497  (Z =   -0.0837)
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AGMI AS RELATED TO PATIENT EXPECTATIONS OF VISUAL
PROGNOSIS OF RESPONDANT

EVENTUAL TOTAL BLINDNESS
NUMBER OF CASES:  3
AVERAGE AGMI:  76.0000
FACTOR 1:      16.4721  (Z =    0.5042)
FACTOR 2:       5.3668  (Z =   -0.7937)
FACTOR 3:       7.9117  (Z =    0.3177)
FACTOR 4:       4.0186  (Z =   -0.0914)
FACTOR 5:       4.0106  (Z =   -0.0202)

CONTINUED LOSSES
NUMBER OF CASES:  14
AVERAGE AGMI:  73.2143
FACTOR 1:      14.4453  (Z =   -0.1996)
FACTOR 2:       6.6407  (Z =    0.1228)
FACTOR 3:       7.0067  (Z =   -0.4558)
FACTOR 4:       4.2200  (Z =    0.1349)
FACTOR 5:       4.1351  (Z =    0.1095)

STABILITY
NUMBER OF CASES:  17
AVERAGE AGMI:  75.3529
FACTOR 1:      15.8382  (Z =    0.2841)
FACTOR 2:       6.4049  (Z =   -0.0469)
FACTOR 3:       7.7181  (Z =    0.1522)
FACTOR 4:       4.3501  (Z =    0.2810)
FACTOR 5:       3.6707  (Z =   -0.3743)

VISION RETURNING
NUMBER OF CASES:  2
AVERAGE AGMI:  86.5000
FACTOR 1:      19.1362  (Z =    1.4293)
FACTOR 2:       6.7348  (Z =    0.1905)
FACTOR 3:       7.5538  (Z =    0.0118)
FACTOR 4:       5.2394  (Z =    1.2803)
FACTOR 5:       4.2608  (Z =    0.2405)

DOES NOT KNOW
NUMBER OF CASES:  23
AVERAGE AGMI:  72.3913
FACTOR 1:      14.0833  (Z =   -0.3253)
FACTOR 2:       6.4309  (Z =   -0.0281)
FACTOR 3:       7.6340  (Z =    0.0803)
FACTOR 4:       3.7102  (Z =   -0.4380)
FACTOR 5:       4.2060  (Z =    0.1833)
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AGMI AS RELATED TO PATIENT'S VISUAL SELF PERCEPTION
OF RESPONDANT

BLIND
NUMBER OF CASES:  1
AVERAGE AGMI:  78.0000
FACTOR 1:      17.4884  (Z =    0.8571)
FACTOR 2:       5.0745  (Z =   -1.0040)
FACTOR 3:       8.8413  (Z =    1.1122)
FACTOR 4:       3.3800  (Z =   -0.8090)
FACTOR 5:       3.7587  (Z =   -0.2826)

SIGHTED
NUMBER OF CASES:  11
AVERAGE AGMI:  76.8182
FACTOR 1:      16.2695  (Z =    0.4339)
FACTOR 2:       6.9197  (Z =    0.3235)
FACTOR 3:       7.2857  (Z =   -0.2174)
FACTOR 4:       3.9539  (Z =   -0.1642)
FACTOR 5:       4.3287  (Z =    0.3111)

PARTIALLY SIGHTED
NUMBER OF CASES:  39
AVERAGE AGMI:  73.9744
FACTOR 1:      14.8182  (Z =   -0.0701)
FACTOR 2:       6.3034  (Z =   -0.1199)
FACTOR 3:       7.5090  (Z =   -0.0265)
FACTOR 4:       4.2287  (Z =    0.1446)
FACTOR 5:       3.9201  (Z =   -0.1145)
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AGMI AS RELATED TO MAJOR OCCUPATION OF RESPONDANT


PROFESSIONAL/MANAGERIAL
NUMBER OF CASES:   14
AVERAGE AGMI:   74.4286
FACTOR 1:       15.0232  (Z =    0.0011)
FACTOR 2:        6.0948  (Z =   -0.2700)
FACTOR 3:        7.7117  (Z =    0.1468)
FACTOR 4:        4.0295  (Z =   -0.0792)
FACTOR 5:        4.2605  (Z =    0.2401)

TECH/SKILLED TRADE
NUMBER OF CASES:   15
AVERAGE AGMI:   73.6000
FACTOR 1:       13.8904  (Z =   -0.3922)
FACTOR 2:        6.7618  (Z =    0.2099)
FACTOR 3:        7.6772  (Z =    0.1173)
FACTOR 4:        4.1441  (Z =    0.0495)
FACTOR 5:        4.1770  (Z =    0.1531)

SEMI-SKILLED/CLERICAL
NUMBER OF CASES:   16
AVERAGE AGMI:   77.6250
FACTOR 1:       16.6181  (Z =    0.5549)
FACTOR 2:        6.4880  (Z =    0.0130)
FACTOR 3:        7.2782  (Z =   -0.2237)
FACTOR 4:        4.2065  (Z =    0.1197)
FACTOR 5:        4.2605  (Z =    0.2402)

UNSKILLED
NUMBER OF CASES:   8
AVERAGE AGMI:   68.6250
FACTOR 1:       13.3724  (Z =   -0.5721)
FACTOR 2:        6.2491  (Z =   -0.1589)
FACTOR 3:        7.6405  (Z =    0.0859)
FACTOR 4:        3.5445  (Z =   -0.6241)
FACTOR 5:        3.3833  (Z =   -0.6736)

NEVER EMPLOYED
NUMBER OF CASES:   3
AVERAGE AGMI:   76.0000
FACTOR 1:       14.0974  (Z =   -0.3204)
FACTOR 2:        6.4736  (Z =    0.0026)
FACTOR 3:        8.3904  (Z =    0.7269)
FACTOR 4:        4.6573  (Z =    0.6262)
FACTOR 5:        4.1764  (Z =    0.1525)
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AGMI AS RELATED TO VOCATIONAL LEVEL OF RESPONDANT


PROFESSIONAL/MANAGERIAL
NUMBER OF CASES:  14
AVERAGE AGMI:  74.4286
FACTOR 1:      15.0232  (Z =    0.0011)
FACTOR 2:       6.0948  (Z =   -0.2700)
FACTOR 3:       7.7117  (Z =    0.1468)
FACTOR 4:       4.0295  (Z =   -0.0792)
FACTOR 5:       4.2605  (Z =    0.2401)

TECHNICAL OR SKILLED TRADE
NUMBER OF CASES:  10
AVERAGE AGMI:  75.5000
FACTOR 1:      15.2618  (Z =    0.0839)
FACTOR 2:       6.7660  (Z =    0.2129)
FACTOR 3:       7.4274  (Z =   -0.0962)
FACTOR 4:       4.3080  (Z =    0.2337)
FACTOR 5:       4.0600  (Z =    0.0312)

SEMI-SKILLED/CLERICAL
NUMBER OF CASES:  15
AVERAGE AGMI:  78.4000
FACTOR 1:      16.5301  (Z =    0.5244)
FACTOR 2:       6.4695  (Z =   -0.004)
FACTOR 3:       7.4339  (Z =   -0.0907)
FACTOR 4:       4.2541  (Z =    0.1732)
FACTOR 5:       4.2940  (Z =    0.2750)

UNSKILLED
NUMBER OF CASES:  7
AVERAGE AGMI:  72.8571
FACTOR 1:      14.2400  (Z =   -0.2708)
FACTOR 2:       6.7838  (Z =    0.2257)
FACTOR 3:       7.9784  (Z =    0.3747)
FACTOR 4:       3.8846  (Z =   -0.2421)
FACTOR 5:       3.5087  (Z =   -0.5430)

UNEMPLOYED
NUMBER OF CASES:  1
AVERAGE AGMI:  74.0000
FACTOR 1:      14.4433  (Z =   -0.2002)
FACTOR 2:       5.8890  (Z =   -0.4180)
FACTOR 3:       8.8413  (Z =    1.1122)
FACTOR 4:       4.6573  (Z =    0.6262)
FACTOR 5:       4.0074  (Z =   -0.0235)
```

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AGMI AS RELATED TO PRESENT EMPLOYMENT STATUS OF RESPONDANT


PART-TIME WORK
NUMBER OF CASES:   3
AVERAGE AGMI:   71.3333
FACTOR 1:       15.1556   (Z =     0.0471)
FACTOR 2:        5.9098   (Z =    -0.4030)
FACTOR 3:        7.9354   (Z =     0.3380)
FACTOR 4:        3.4553   (Z =    -0.7244)
FACTOR 5:        3.5914   (Z =    -0.4569)

FULL-TIME WORK
NUMBER OF CASES:   12
AVERAGE AGMI:   81.2500
FACTOR 1:       17.9056   (Z =     1.0019)
FACTOR 2:        6.2700   (Z =    -0.1439)
FACTOR 3:        7.7030   (Z =     0.1393)
FACTOR 4:        4.6196   (Z =     0.5838)
FACTOR 5:        4.1353   (Z =     0.1097)

STUDENT
NUMBER OF CASES:   2
AVERAGE AGMI:   69.0000
FACTOR 1:       14.5802   (Z =    -0.1527)
FACTOR 2:        4.6360   (Z =    -1.3194)
FACTOR 3:        8.1231   (Z =     0.4984)
FACTOR 4:        4.0751   (Z =    -0.0280)
FACTOR 5:        3.5077   (Z =    -0.5441)

HOMEMAKER
NUMBER OF CASES:   1
AVERAGE AGMI:   57.0000
FACTOR 1:       10.4871   (Z =    -1.5739)
FACTOR 2:        6.7660   (Z =     0.2129)
FACTOR 3:        4.8006   (Z =    -2.3413)
FACTOR 4:        3.6060   (Z =    -0.5551)
FACTOR 5:        2.5058   (Z =    -1.5877)

RETIRED
NUMBER OF CASES:   28
AVERAGE AGMI:   74.0714
FACTOR 1:       14.0726   (Z =    -0.3290)
FACTOR 2:        6.6698   (Z =     0.1437)
FACTOR 3:        7.7852   (Z =     0.2096)
FACTOR 4:        4.0993   (Z =    -0.007)
FACTOR 5:        4.2873   (Z =     0.2680)

UNEMPLOYED
NUMBER OF CASES:   11
AVERAGE AGMI:   73.4545
FACTOR 1:       15.2907   (Z =     0.0940)
FACTOR 2:        6.4527   (Z =    -0.0124)
FACTOR 3:        6.7366   (Z =    -0.6867)
FACTOR 4:        3.9539   (Z =    -0.1642)
FACTOR 5:        3.9874   (Z =    -0.0444)
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AGMI AS RELATED TO PRIMARY SOURCE OF FINANCIAL
SUPPORT OF RESPONDANT

DIVIDENDS - INTEREST - RENT OR SAVINGS
NUMBER OF CASES:  3
AVERAGE AGMI:  75.6667
FACTOR 1:       14.7338  (Z =   -0.0994)
FACTOR 2:        7.0375  (Z =    0.4083)
FACTOR 3:        8.3904  (Z =    0.7269)
FACTOR 4:        3.9187  (Z =   -0.2037)
FACTOR 5:        4.0935  (Z =    0.0661)

FAMILY - FRIENDS
NUMBER OF CASES:  10
AVERAGE AGMI:  76.6000
FACTOR 1:       16.4734  (Z =    0.5047)
FACTOR 2:        7.1732  (Z =    0.5059)
FACTOR 3:        7.1028  (Z =   -0.3737)
FACTOR 4:        4.3493  (Z =    0.2801)
FACTOR 5:        3.6841  (Z =   -0.3603)

PUBLIC ASSISTANCE
NUMBER OF CASES:  0

OWN EARNINGS
NUMBER OF CASES:  10
AVERAGE AGMI:  80.1000
FACTOR 1:       17.4647  (Z =    0.8488)
FACTOR 2:        6.2523  (Z =   -0.1566)
FACTOR 3:        8.2058  (Z =    0.5691)
FACTOR 4:        4.3267  (Z =    0.2547)
FACTOR 5:        4.0600  (Z =    0.0312)

SOCIAL SECURITY
NUMBER OF CASES:  25
AVERAGE AGMI:  73.6800
FACTOR 1:       13.9895  (Z =   -0.3578)
FACTOR 2:        6.6232  (Z =    0.1102)
FACTOR 3:        7.6860  (Z =    0.1248)
FACTOR 4:        4.1210  (Z =    0.0236)
FACTOR 5:        4.2905  (Z =    0.2713)

OTHER
NUMBER OF CASES:  7
AVERAGE AGMI:  67.2857
FACTOR 1:       12.9602  (Z =   -0.7152)
FACTOR 2:        5.5667  (Z =   -0.6499)
FACTOR 3:        6.9044  (Z =   -0.5433)
FACTOR 4:        3.9920  (Z =   -0.1214)
FACTOR 5:        3.6159  (Z =   -0.4313)
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AGMI AS RELATED TO SMALLEST PRINT WITH RX OF RESPONDANT


HEADLINES
NUMBER OF CASES:  9
AVERAGE AGMI:  72.7778
FACTOR 1:       14.9857  (Z =   -0.0119)
FACTOR 2:        6.3901  (Z =   -0.0575)
FACTOR 3:        7.0263  (Z =   -0.4390)
FACTOR 4:        3.9313  (Z =   -0.1896)
FACTOR 5:        4.0653  (Z =    0.0368)

NEWSPRINT
NUMBER OF CASES:  6
AVERAGE AGMI:  77.5000
FACTOR 1:       16.0953  (Z =    0.3734)
FACTOR 2:        7.0479  (Z =    0.4157)
FACTOR 3:        7.4727  (Z =   -0.0575)
FACTOR 4:        4.1627  (Z =    0.0705)
FACTOR 5:        3.8018  (Z =   -0.2378)

SUB-HEADLINES
NUMBER OF CASES:  11
AVERAGE AGMI:  70.1818
FACTOR 1:       13.4086  (Z =   -0.5595)
FACTOR 2:        6.9197  (Z =    0.3235)
FACTOR 3:        7.2570  (Z =   -0.2419)
FACTOR 4:        3.5988  (Z =   -0.5631)
FACTOR 5:        4.0783  (Z =    0.0503)

PHONE BOOK PRINT
NUMBER OF CASES:  8
AVERAGE AGMI:  73.7500
FACTOR 1:       15.8069  (Z =    0.2732)
FACTOR 2:        5.7950  (Z =   -0.4856)
FACTOR 3:        7.7287  (Z =    0.1613)
FACTOR 4:        4.3238  (Z =    0.2515)
FACTOR 5:        3.6338  (Z =   -0.4127)

LARGE PRINT
NUMBER OF CASES:  10
AVERAGE AGMI:  75.9000
FACTOR 1:       15.0476  (Z =    0.0096)
FACTOR 2:        6.0706  (Z =   -0.2873)
FACTOR 3:        8.2201  (Z =    0.5812)
FACTOR 4:        4.0226  (Z =   -0.0870)
FACTOR 5:        4.0853  (Z =    0.0576)

CLASSIFIED ADS
NUMBER OF CASES:  2
AVERAGE AGMI:  82.5000
FACTOR 1:       17.7981  (Z =    0.9646)
FACTOR 2:        7.6117  (Z =    0.8214)
FACTOR 3:        6.8776  (Z =   -0.5662)
FACTOR 4:        4.6573  (Z =    0.6262)
FACTOR 5:        4.0098  (Z =   -0.0211)
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AGMI AS RELATED TO AGE OF RESPONDANT


LESS THAN 21 YEARS OLD
NUMBER OF CASES:  5
AVERAGE AGMI:  76.4000
FACTOR 1:       15.6590  (Z =     0.2219)
FACTOR 2:        6.7535  (Z =     0.2039)
FACTOR 3:        7.7828  (Z =     0.2075)
FACTOR 4:        4.4244  (Z =     0.3645)
FACTOR 5:        3.8085  (Z =    -0.2308)

BETWEEN 21 AND 70 YEARS OLD
NUMBER OF CASES:  26
AVERAGE AGMI:  74.9231
FACTOR 1:       16.1036  (Z =     0.3763)
FACTOR 2:        5.9467  (Z =    -0.3764)
FACTOR 3:        7.3935  (Z =    -0.1252)
FACTOR 4:        4.0201  (Z =    -0.0897)
FACTOR 5:        3.8270  (Z =    -0.2115)

BETWEEN 70 AND 82 YEARS OLD
NUMBER OF CASES:  23
AVERAGE AGMI:  74.3043
FACTOR 1:       14.2775  (Z =    -0.2578)
FACTOR 2:        6.7987  (Z =     0.2364)
FACTOR 3:        7.5876  (Z =     0.0407)
FACTOR 4:        4.3324  (Z =     0.2611)
FACTOR 5:        4.1733  (Z =     0.1493)

MORE THAN 83 YEARS LD
NUMBER OF CASES:  7
AVERAGE AGMI:  71.2857
FACTOR 1:       12.9384  (Z =    -0.7228)
FACTOR 2:        7.1150  (Z =     0.4641)
FACTOR 3:        7.7708  (Z =     0.1973)
FACTOR 4:        3.4179  (Z =    -0.7664)
FACTOR 5:        4.5109  (Z =     0.5009)
```

AGMI AS RELATED TO ~~2405~~ EDUCATION LEVEL OF RESPONDANT

```
PRE-SCHOOL
NUMBER OF CASES:  0

KINDERGARTEN
NUMBER OF CASES:  0

HIGH SCHOOL DIPLOMA
NUMBER OF CASES:  10
AVERAGE AGMI:  75.2000
FACTOR 1:      15.8365  (Z =     0.2835)
FACTOR 2:       6.5091  (Z =     0.0281)
FACTOR 3:       7.0167  (Z =    -0.4473)
FACTOR 4:       4.0751  (Z =    -0.0280)
FACTOR 5:       4.2355  (Z =     0.2141)

SOME COLLEGE
NUMBER OF CASES:  4
AVERAGE AGMI:  77.7500
FACTOR 1:      17.5000  (Z =     0.8611)
FACTOR 2:       5.2781  (Z =    -0.8575)
FACTOR 3:       7.9467  (Z =     0.3476)
FACTOR 4:       4.0469  (Z =    -0.0597)
FACTOR 5:       4.3230  (Z =     0.3052)

VOC./TECH. SCHOOL
NUMBER OF CASES:  3
AVERAGE AGMI:  70.0000
FACTOR 1:      12.4179  (Z =    -0.9035)
FACTOR 2:       7.0375  (Z =     0.4083)
FACTOR 3:       7.0575  (Z =    -0.4124)
FACTOR 4:       3.8811  (Z =    -0.2460)
FACTOR 5:       3.7603  (Z =    -0.2809)

4-YEAR COLLEGE DEGREE
NUMBER OF CASES:  9
AVERAGE AGMI:  77.7778
FACTOR 1:      15.5762  (Z =     0.1931)
FACTOR 2:       6.8565  (Z =     0.2780)
FACTOR 3:       7.2722  (Z =    -0.2289)
FACTOR 4:       4.7031  (Z =     0.6777)
FACTOR 5:       4.5387  (Z =     0.5299)

SOME GRADUATE SCHOOL
NUMBER OF CASES:  0

GRADUATE DEGREE
NUMBER OF CASES:  2
AVERAGE AGMI:  77.0000
FACTOR 1:      15.0352  (Z =     0.0053)
FACTOR 2:       7.1732  (Z =     0.5059)
FACTOR 3:       8.4675  (Z =     0.7927)
FACTOR 4:       3.2866  (Z =    -0.9139)
FACTOR 5:       4.2608  (Z =     0.2405)
```

Appendix B

x g a j p m u l c d s b r h o

f w z i t b k e n q v y a m r

yes so j pop sat d at c am h in so

oh of n to am g k in u do of s b

fire side past gold fish own sky help

advice badger slide anyone table mirror

understudy sportsman campground fenders

bad z navy specific g show dog amber
narrow today penny cream hopped honest
meantime upbringing summertime splendid
quick sand spiteful outlast stops winds
side walk tracking readily overshadow employ
story milk bunny college crayons idea gotten

SCORE SHEET

Form B

PATIENT:

TEST #

DATE:

COMMENTS:

EVALUATOR:

TARGET SIZE:

LENS:

EYE: OD: OS: OU:

LIGHTING:

# ITEMS Per Line

SCORE: % Correct

Time:

h r e p b v t l d x z j m i s

y s m z d t p q n o w c i f j

sing I do all to a song joy laughter

up k g a in t he we an u n i no

out cast hit cut boy hood road tray

never times coward drunk f lower blinks

greater snowball fireplace compromise

the greater running to hot two maples
treat gloves owner uphold alarm graze
opinion forbidden postpone useless
seam stress adulthood password tender
carefree dome enjoy able incorrect absentee
you have just successfully finished a test

PROMPTING: 10 sec (no attempt); 20 sec (with attempt) --- (______)

MISPRONOUNCIATION: e.g. traffic -- fractif

OMISSION: ⬭

INSERTION: ∧

INVERSION: O/N

REPETITION: 〰

Connects words: ‿

JUMPING OR CHANGING WORD ORDER: e.g. away out

SUBSTITUTION: e.g. Once upon a time -- there was

Patient Name:______________________________

Low Vision Aid 1_______ 2_______ 3_______

Illumination: position_________________________

Time of Day:
Patient Manner:
Instructor Manner:
Time of Day:
Patient Manner:
Time of Day:
Patient Manner:

eye:
Level page:

Visual skill problems________
focal dist.________
ecc viewing________
localization________
scanning________
letter recog.________
word recog.________
suspect compre.________
Why?

Training - Eccentric Viewing Project 2

1. Discussion of Eye Condition

____ Acuities
____ Fields
____ Complications

2. Functional check of ecc. viewing position

____ a) patient able to position scotoma mid-face
____ b) patient able to move scotoma to all quadrants
____ c) patient able to notice in which quandrant face appears clearest

3. Transfer of ecc. viewing skills to objects as targets

____ a) patient able to position target into scotoma
____ b) patient able to ecc. view to see target
____ c) patient able to compare ecc.viewing position with target
____ d) patient able to maintain ecc. viewing position when scanning from one target to another
____ e) patient able to maintain ecc. viewing position when scanning 3 or more objects

4. 3M Quillman excercises

____ a) patient is able to position first letter in the best area of ecc. viewing to identify it correctly.
____ b) patient is able to scan 2 rows and identify letters with 2 or less errors per row.
____ c) two letter words
____ d) three letter words
____ e) 5-7 letter words
____ f) sentences

5. 2M Quillman excercises

____ a)

____ b)

____ c)

____ d)

____ e)

____ f)

6. 1M Quillman excercises

____ a)

____ b)

____ c)

____ d)

____ e)

____ f)

7. Commercially available print (criteria: - 3 rows consistently recognizable with with 1 error/row.)

____ a) large print

____ b) typed print

____ c) book print

____ d) magazine print

____ e) newspaper

____ f) dictionary/Bible print

____ g) miscellaneous:

____

____

____

____

EYE CARE SPECIALIST'S EXAMINATION PROTOCOL FOR PATIENTS WITH CENTRAL VISUAL FIELD LOSS

1. Visual Acuities: Near Testing with Feinbloom Numbers Chart for Partially Sighted at Patient's reading distance.

   Distance Testing with Feinbloom Distance Acuity Chart at ten and twenty feet.

2. Objective and Subjective Refraction with Trial Frame and Lenses

3. Visual Fields: (all tests performed with Best Standard Spectacle Correction)

   Amsler Grid Test at Patient's reading distance if unrecognizable at Standard 33cm distance.

   Tangent Screen and Arc Perimetry at 1 Meter with 3mm white target.

4. Dilated Ocular Health examination using Biomicroscopy, Direct and Indirect Ophthalmoscopy

5. Magnification Evaluation using A.O. microscopic lenses

EVALUATION OF EYE TRACKER

Nearly all systems for measuring eye movements require accurate and highly reproduciable fixation by the subject in order to define the gain of the recording systems (Young, 1975). This requirement precludes their use with individuals with foveal scotomas who cannot maintain the requisite steady gaze. Over the past year I have constructed a system based on the magnetic field search coil developed for eye movement measurement by Robinson (1963) that will enable us to objectively calibrate the gain (i.e. without requiring steady fixation).

THE SYSTEM. In the basic Robinson Search Coil system, a coil is attached to the eye and the eye is centered in two magnetic fields that are in spatial quadrature. The fields from each of two pairs of coils in one spatial quadrature are generated by oscillations that are in temporal quadrature; these fields induce a current in the eye coil. A vector lock-in amplifier referenced to the horizontal fields, separates the horizontal and vertical components of the eye coil signal and provides suitable amplification and rectification of the signal. The lock-in amplifier outputs two D.C. voltages, proportional to the sine of the angular eye position for horizontal and vertical eye rotations. Deviations from linearity are insignificant up to about 20 degrees eccentricity.

In order to objectively calibrate the system, one must simply mount a search coil on a pair of gimbles, rotate it through a known angle and adjust the gain to, lets say, 2 degrees per volt for the primary and secondary axes of rotation. The same coil is then mounted on the eye and the experimental session proceeds. The accuracy of this calibration is limited by: 1) how well the phase and amplitude of the magnetic fields are regulated; 2) the uniformity of the field densities at the center; and 3) how well the center position of the coil was reproduced from calibration to testing.

In our system, phase and amplitude of the fields are regulated by a circuit recently developed by Opticon, Frank, Smith and Colburn (1982). After an hour warm up, no change in phase and amplitude were measurable over 8 hours. Theoretically, both the orientation of the lines of flux and the field density change as one moves a pick-up coil through the center of the fields. As the fields become more uniform at the center, the positioning of the coil becomes less critical for gain stability. To increase the uniformity of the fields at the center we wound 6 foot diameter coils so that the position of the subject's head becomes less critical.

PERFORMANCE CHARACTERISTICS:

In order to test the performance characteristics of our system we mounted a Scalar silicon annulus coil (Collewijn, Mark, and Jansen, 1975) on a rig constructed out of plastic to minimize interference with the fields. The coil was mounted 11 mm from the center of rotation, to duplicate its relative average position on the adult human eye. A gimbled arrangement was used to rotate the coil with the horizontal being the stationary axis. Mechanical stops were used to ensure exact replication of a particular coil orientation.

Starting at the center of the fields, we positioned the coil orientation to a number of primary and secondary positions within 20 degrees of the primary position (40 degrees range). The center of the coil was then moved about 3.5 cm along horizontal, vertical and Z axes (a range of about 7 cm). Finally the coil was mounted on an eye and the subject fixated points on a tangent screen. We calculated the gain of the horizontal and vertical components by a parametric regression analysis of output voltage against angular position along the primary and secondary axes. Horizontal and vertical position signals were sampled and processed by a DEC 11/23 computer. Fixations were sampled for 5 seconds at 50 Hz and mean, standard deviation and standard errors were computed.

We found that moving the center of the artifical eye within the above specified range produced a change in gain of no more than 0.575% of the gain measure at the center of the fields. This translates into a 6.9 minarc error at 20 degrees. When the coil was mounted on a subject's eye we found that the objective calibration overestimated the fixation calibration by up to 0.6%. The eye tended to drift toward primary position during the more eccentric fixations so an overestimation is to be expected. The noise level of the system is 2.1 mV RMS, much of this due to building vibration. When the computer is tied in, the noise levels increase an order of magnitude to 20 mV or about 2 minarc with a 2 degree/volt gain. With the coil on the eye we found that the standard deviation of 5 second sample periods hovered around 2-4 minarc, slightly higher than published reports (e.g. Steinman, 1965). In a free headed situation the noise levels increased to 4-8 minarc.

CONCLUSIONS: System Specification (2 degree/volt gain settings)

Range	34 degrees
Noise levels with a fixed search coil	2 minarc
Gain stability with head translations within 3 cm. of the center of the fields	0.6%
Bandpass (-3 db)	0-200 Hz.

The performance of system is affected by slippage of the coil on the eye. With the Scalar annulus such slippage is less than 0.5 minarc (Collewijn, et al, 1975). Slippage of a fitted scleral lens on the eye is somewhat greater even with 15 mm underpressure, however, it is unlikely to exceed the current noise levels of our system.

The noise levels of our system although somewhat high compared with other magnetic field systems (eg. Robinson, 1963), can be improved by modifying analogue sampling routines and electronics of our computer or by increasing the sensitivity of the vector lock in amplifier. The current level of performance is certainly adequate for the research we propose with the partially sighted. Their viewing stability is unlikely to approach the current noise levels of our system.

The system has been constructed so as to be easily accessible to the low vision patient. For subjects who will have eye movements measured once or twice, the scalar annulus coil will be used as one size fits most everyone. For subjects undergoing repeated testing (e.g. biofeedback training), a scleral lens will be fitted and used as it is less irritating to the eye. A contact lens specialist on our staff is quite adept at fitting this lens and Conar optics in NYC can supply them, with coil imbedded, within 2 weeks.

VISUAL INSTRUCTION PROCEDURES

The subjects who participated in this study were selected primarily from the applicants to the William Feinbloom Vision Rehabilitation Center by project staff familiar with preliminary application data and the project requirements.

Applicants who fit project criteria were telephoned and the project was explained to them. If they chose to participate, the procedures below were followed. If they declined, they were referred to the WFVRC patient pool.

INITIAL VISIT:

1. Consent forms were explained to and signed by the subject.
2. Subjects were administered Form A of the Visual Skills for Reading (VSR) Test in a recognizable print size. The subject used his/her own glasses or was unaided during the testing.
3. Subjects received the Psychosocial Inventory and an intake interview by a social worker to obtain relevant demographic, psychosocial, visual history, employment, and education related information.
4. Subjects were given a low vision examination which included visual field analysis and tentative prescription of optical aid(s) with appopriate magnification for recognizing 1M symbols. (See Appendix)
5. Subjects were administered Form B of the VSR test in 1M size. Subjects used the tentatively prescribed optical aid to recognize the 1M size symbols.
6. Subjects were rescheduled for the next visit.

SECOND VISIT:

1. Subjects were trained in the use of visual skills for reading without using the prescribed optical aid.
2. Subjects were trained in the use of visual skills for reading with the prescribed optical aid.
3. Based on the subject's performance and the need, modifications were made in the type and power of optical aids.
4. Subjects were loaned the optical aid with specific exercises and instructions for improving their visual skills while reading.
5. Subjects were administered Form C of the VSR test in 1M size. Subject used the optical aid to recognize the 1M test.
6. Subjects were rescheduled for their next visit.

THIRD VISIT:

1. Subject and instructor discussed the difficulties and successes with the loaned optical aid and exercises.

2. Subject demonstrated visual skills for reading with the optical aid.

3. Subject was trained in more advanced visual skills for reading.

4. Based on the performance and needs of the subject, modifications were made in the type and power of optical aid.

5. Subjects were loaned the optical aid with specific exercises and instructions for improving visual skills for reading.

6. Form D of the VSR test in 1M size was administered.

7. Subjects rescheduled for the next visit.

FOURTH VISIT:

1. - 4. Same as third visit

5. Form E of the VSR test in 1M size was administerer to the subjects using the optical aid for recognition.

6. Subjects chose one of the following options:

   a. terminated
   b. were prescribed the appropriate optical aid and continued practicing at home
   c. were re-loaned the optical aid and returned to the WFVRC as a low vision patient to continue training and explore other needs

7. All subjects received a social services post-training interview to determine subjects' satisfaction and suggestions.

Appendix C

EYE CARE SPECIALIST'S FRESNEL PRISM EXAMINATION PROTOCOL FOR PATIENTS WITH CONSTRICTED VISUAL FIELDS

1. Visual Acuities at five, ten and twenty feet (Unaided and aided with Standard Spectacle Correction) using Feinbloom Distance Acuity Chart. Near acuities taken at 40cm and 20cm.

2. Objective and Subjective Refraction with Trial Frame and Lenses

3. Binocularity Testing with Red Lens Test and/or Worth 4 Dot

4. Visual Fields: Tangent Screen and Arc Perimetry with best Standard Spectacle Correction at 1 Meter with a 3mm White Target(Goldman perimetry preferred if available)

5. Placement of thirty Δ lens

6. Visual Acuity at five, ten, and twenty feet with thirty Δ lens

7. Dilated Ocular Health examination using Biomicroscopy, Direct and Indirect Ophthalmoscopy

(It is suggested that for future research the eye care specialist consider the following additional testing procedures: Binocular Visual Acuities and Binocular Visual Fields, both with and without Fresnel prism)

ORIENTATION AND MOBILITY INVENTORY

Directions: A number of common orientation and movement situations are given below. Read each situation and circle the number which best expresses the level of difficulty you feel in the situation. On a scale of 1 - 5, 1 represents no difficulty and 5 represents extreme difficulty.

TRAVELING IN FAMILIAR AREAS	1	2	3	4	5
TRAVELING IN UNFAMILIAR AREAS	1	2	3	4	5
TRAVELING IN: HOME	1	2	3	4	5
WORK SETTING	1	2	3	4	5
CLASSROOM	1	2	3	4	5
TRAVELING IN CROWDED SITUATIONS	1	2	3	4	5
TRAVELING AT NIGHT	1	2	3	4	5
NEGOTIATING PUBLIC TRANSPORTATION:	1	2	3	4	5
BUS	1	2	3	4	5
SUBWAY	1	2	3	4	5
TRAIN	1	2	3	4	5
PLANE	1	2	3	4	5
LOCATING - UP STEPS	1	2	3	4	5
LOCATING - DOWN STEPS	1	2	3	4	5
WALKING UP STEPS	1	2	3	4	5
WALKING DOWN STEPS	1	2	3	4	5
STEPPING ONTO CURBS	1	2	3	4	5
STEPPING OFF CURBS	1	2	3	4	5
WALKING THROUGH DOORWAYS AND NARROW PASSAGEWAYS	1	2	3	4	5
ADJUSTING TO LIGHTING CHANGES:					
INDOOR TO OUTDOOR	1	2	3	4	5
OUTDOOR TO INDOOR	1	2	3	4	5

ADJUSTING TO GLARE	1	2	3	4	5
TRAVELING THROUGH DIMLY LIT AREAS	1	2	3	4	5
TRAVELING THROUGH STORES	1	2	3	4	5
KNOWING WHEN ANOTHER PERSON IS PRESENT	1	2	3	4	5
BUMPING INTO: PERSONS	1	2	3	4	5
OBJECTS	1	2	3	4	5
WALLS	1	2	3	4	5
TRIPPING OVER LOW-LYING OBJECTS OR UNEVEN TRAVEL SURFACES	1	2	3	4	5
MOVING AROUND IN SOCIAL GATHERINGS	1	2	3	4	5
FINDING REST ROOMS IN PUBLIC PLACES	1	2	3	4	5
SEEING CARS AT INTERSECTIONS	1	2	3	4	5
DRIVING	1	2	3	4	5
DEPENDING ON OTHERS TO ASSIST YOU IN TRAVEL SITUATIONS	1	2	3	4	5
ASSISTING OTHERS IN TRAVEL SITUATIONS	1	2	3	4	5
MOVING WITH EASE	1	2	3	4	5
MOVING WITH SPEED	1	2	3	4	5
FEELING COMFORTABLE WHILE TRAVELING	1	2	3	4	5

o Indoors
o Residential
o Small Business
o Downtown
o Crowded Area
o Public Transportation

Name:

Date;

FEINBLOOM MOBILITY CRITICAL EVENTS CHECKLIST

Objects/ Events	Avoids	Bumps	Locates		Field*				Lighting	Comments
			Easily	Problem	L	R	S	I		
Walls										
People										
Chair										
Desk										
Plant										
Post										
Pole										
Bicycle										
Sign										
Opening door										
Door										
Object on floor										
Protrusion from wall										
Item in store										
Car										
Grocery cart										
Street sign										
House number										
Visual landmark										

*L=left, R=right, S=superior, I=Inferior

Objects/ Events	Avoids	Bumps	Locates		Field*				Lighting	Comments
			Easily	Problem	L	R	S	I		
Oversteps curbs										
Curb edge										
Veering at crossing										
Crossing safely										
Oncoming cars										
Potholes										
Up-steps safely										
Down-steps safely										
Object in store										
Seat in restaurant										
Public restroom										
Department in store										
Subway platform										
Correct bus										
Familiar faces										
People standing adjacent										
**										

*L=left, R=right, S=superior, I=Inferior

Comments:

**Note: Blank spaces and this Comments section allow for notation of problems encountered, but not printed on this form.

PERSONAL INVENTORY-AGMI

Directions:

The statements below have been used to describe how people see themselves or others. Please read each statement and circle the number to the right of the statement which indicates whether you agree or disagree with the statement. Answer each statement as it relates to how you view yourself.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. I have to push myself very hard to do anything	1	2	3	4	5
2. I feel self-confident	1	2	3	4	5
3. My family strongly supports my efforts to improve the use of my vision	1	2	3	4	5
4. I feel, I'll never enjoy things the way I use to	1	2	3	4	5
5. I feel helpless and don't expect change	1	2	3	4	5
6. I find myself getting upset over small, unimportant things	1	2	3	4	5
7. I feel that I have nothing to look forward to	1	2	3	4	5
8. My visual problems have not altered my relationships with family and/or friends	1	2	3	4	5

	Strongly disagree	Agree	Neutral	Disagree	Strongly disagree
9. With practice and patience I can do jobs pretty well	1	2	3	4	5
10. I become tense and upset when I think about my present condition	1	2	3	4	5
11. I usually feel down in the dumps and without energy	1	2	3	4	5
12. I feel happy and content	1	2	3	4	5
13. A change in my visual abilities would probably cause difficulty	1	2	3	4	5
14. It means a lot for me to be able to support myself financially	1	2	3	4	5
15. My moods are unpredictable and often extreme	1	2	3	4	5
16. I am satisfied with most aspects of my life	1	2	3	4	5
17. I should not be expected to take care of myself	1	2	3	4	5
18. I often feel angry	1	2	3	4	5
19. My family relationships help keep me going	1	2	3	4	5
20. New things make me very anxious	1	2	3	4	5
21. People with disabilities like mine should not be expected to accomplish as much	1	2	3	4	5

Date: ____________________

Self-Analysis Questionnaire

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally *feel*.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to best describe how you generally feel.

		Not at All	Somewhat	Moderately So	Very Much So
1.	I feel pleasant	1	2	3	4
2.	I tire quickly	1	2	3	4
3.	I feel like crying	1	2	3	4
4.	I wish I could be as happy as others seem to be	1	2	3	4
5.	I am losing out on things because I can't make-up my mind soon enough	1	2	3	4
6.	I feel rested	1	2	3	4
7.	I am "calm, cool and collected"	1	2	3	4
8.	I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
9.	I worry too much over something that really doesn't matter	1	2	3	4
10.	I am happy	1	2	3	4

	Not at All	Somewhat	Moderately So	Very Much So
11. I am inclined to take things hard	1	2	3	4
12. I lack self-confidence	1	2	3	4
13. I feel secure	1	2	3	4
14. I try to avoid facing a crisis or difficulty	1	2	3	4
15. I feel blue	1	2	3	4
16. I am content	1	2	3	4
17. Some important thought runs through my mind and bothers me	1	2	3	4
18. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
19. I am a steady person	1	2	3	4
20. I become tense and upset when I my present concerns	1	2	3	4

FUNCTIONAL EVALUATION & TRAINING TECHNIQUES
IN THE USE OF FRESNEL PRISMS
FOR INDIVIDUALS WITH RESTRICTED VISUAL FIELDS

by

Duane R. Geruschat, M.A.

and

Audrey J. Smith, M.Ed.

OBJECTIVE 1: To locate margin of viable and non-viable area of functional visual field

PROCEDURE:

- Trainee sits and faces another individual positioned at a distance of 5 - 10 feet
- Trainee fixates on face of person across room
- While standing at trainee's side, instructor slides a straight edge occluder slowly across front surface of trainee's glasses, from area of field loss toward area of viable field
- Trainee signals when occluder is detected in visual field
- Instructor slowly withdraws occluder until trainee signals occluder no longer interferes with visual field
- Repeat above steps until consistent response is obtained
- Mark edge of glasses or frame to indicate margin of functional visual field

OBSERVATIONS:

- Patch the eye not being tested. This eliminates any possibility of suppressing the eye being tested or possible confusion from using both eyes.
- The distance at which trainee sits from fixation target can vary. Experience shows that it is easier for the trainee to fixate when viewing a target at approximately 10 feet, however, using a distance greater than 10 feet seems to provide similar results.
- All trainees should wear their own prescriptive lenses or be provided with plano lenses for the duration of the vision training.
- Person being used as a fixation target should assist in monitoring trainee's eye movements.
- The following are various types of occluders which can be used: index card, gummed label, or any straight edged surface.
- Instructor should stand to side and slightly behind trainee to assist with monitoring trainee's eye fixation.
- Movement of the occluder should be slow enough to allow trainees enough reaction time to signal the exact location for the margin of viable field.
- Marking lens or frame can be done with a fine point felt tip pen.
- A self adhering occluder can be attached directly to the lens surface, an occluder which does not self-adhere can be attached with scotch tape.
- Once static placement is completed, the occluder is attached 1mm toward the area of field loss because experience indicates that once movement is introduced most trainees will shift gaze and this adjustment encourages eye scanning.

OBJECTIVE: To determine effect of movement on margin of viable and non-viable area of functional visual field

PROCEDURE:

- With occluder placed on glasses, trainee moves about giving feedback as to whether or not occluder interferes with visual functioning
- If trainee reports interference, instructor moves occluder approximately 1mm towards area of field loss
- Repeat above steps until trainee reports no interference from occluder
- Prism is cut and placed in same position as occluder
- A 30Δ lens is recommended for all candidates
- The base of the prism is placed toward the area of field loss. If loss is temporal, base out prism is used. If loss is superior, base up prism is used, etc.

OBSERVATIONS:

- Instructor should select an environment relatively uncluttered and free of potential hazards such as drop-offs, steps, overhanging objects and congested areas.
- Trainee should use customary method of travel (i.e., unaided, sighted guide, cane, etc.).
- Instructor encourages trainee's normal posture and eye movements. Trainee should consciously try to look for occluder. Any detection of occluder should result from inadvertent eye movement into occluder area.
- Some trainees will report inadvertent eye movement into the prism when making sharp turns. This is easily compensated and should not affect placement of prism unless trainee reports continued problems and confusion with turns.
- If trainee continually reports interference from occluder even after occluder has been adjusted, this may be indicative of unsuspected areas of viable field(i.e., islands of vision). Clinical field tests, particularly arc perimetry, should be redone.
- Depending on setting, an ophthalmologist, optometrist or educational/rehabilitation professional cuts and places the prism.
- When determining final placement prism should be placed 1mm further toward area of field loss to avoid prism "crowding" viable visual field. If prism is placed too close to the marginal area, the possibility exists that trainee may position eye partially in viable field and prism at the same time. This will result in double vision.
- Prism is also placed 1mm further toward area of field loss to encourage trainee's conscious eye movement into the prism. This increased eye scanning will result in more efficient visual functioning.

OBJECTIVE: Exposure to viewing through prism and refinement of eye movement in and out of prism area

PROCEDURE:

- While seated, trainee looks straight ahead
- Keeping head still, trainee moves eye toward area where prism is placed
- Trainee describes effect of prism on vision
- Trainee returns to straight ahead gaze
- Repeat above steps until trainee has mastered prism awareness and eye movement in and out of prism area

OBSERVATIONS:

- Instructor should be positioned in front of trainee to monitor trainee's eye movement and confirm when trainee's eye is correctly positioned behind the prism.
- Trainee may experience one or more of the following effects when viewing through the prism:
  a. Blur effect or reduction in visual acuity
  b. Objects appear to jump from one position to another ("Jack-in-the Box" effect)
  c. Displacement of objects from their expected position
  d. The appearance of viewing as if "underwater".
- Trainee should be instructed to move eye as far into prism area as possible. Eye movement just inside of prism or close to margin of viable visual field will increase the effect of the blind spot, whereas eye movement further into the prism will decrease blind area.
- Instructor should select an environment which will minimize any figure-ground difficulty, for example, trainee should face an area wall which provides good contrast. Complex visual patterns should be avoided.

OBJECTIVE: To demonstrate displacement effect while viewing through prism.

PROCEDURE:

- While seated, trainee looks straight ahead and extends arm in front of viable field of view
- Keeping head and eyes still, trainee slowly moves hand out of field of view (towards prism area)
- Trainee moves eye to view through prism and locates position of hand
- While viewing thorugh prism, trainee points to apparent position of extended hand
- Trainee moves eye out of prism area, turns head towards hand and compares actual and perceived position of extended hand
- Trainee repeats first three steps and grasps extended hand, while viewing through prism
- Trainee describes effect of displacement
- Trainee repeats all of the above steps with extended hand in different areas of visual field (i.e., in and out, up and down, and left and right)

OBSERVATIONS:

- The extended arm should always be on the same side as prism.
- This technique provides the trainee with an opportunity to experience the functional effects of prism displacement. By utilizing the proprioceptive and kinesthetic information obtained during the pointing and grasping activities, the trainee can begin the adaptation process by verifying tactually the visual input.
- During the pointing phase, do not allow the trainee's pointing hand in lower field and at midline.
- Encourage trainee to verbalize a description of the prism's displacement effect to confirm/insure the trainee's understanding of displacement.
- One trainee points to apparent position of extended hand, urge trainee to maintain this position to verify with regular vision the prism displacement. On grasping activities, caution against moving hand to correct any under or over reaching. Trainee should again maintain hand position, turn head, and verify with regular vision the effect of prism displacement.
- Grasping activities are introduced as the initial phase of developing accurate eye-hand coordination. Acquisition of this skill is critical to the trainee's eventual success or failure when using prisms in real life situations.
- Begin to vary figure-ground effect.

OBJECTIVE: To achieve accurate eye-hand coordination while viewing through prism.

PROCEDURE:

- While seated, trainee looks straight ahead
- Standing behind trainee, instructor extends hand into trainee's viable field of view
- Trainee keeps head and eyes still, as instructor moves hand out of trainee's field of view
- Trainee moves eyes to view through prism and locates instructor's hand
- Trainee points to apparent position of instructor's hand
- Trainee moves eye out of prism area, turns head, and confirms actual and perceived position of instructor's hand
- Continue practice, repeating above steps, with instructor's hand in various areas of trainee's visual field
- Repeat above first four steps with trainee grasping instructor's hand, while viewing through the prism
- Repeat all of the above steps using larger then smaller objects, in place of the instructor's hand
- Trainee locates and grasps various sized objects while viewing through the prism

OBSERVATIONS:

- Instructor should be positioned behind and to side of trainee, from this position the trainee will not pick up clues as to where the instructor's hand is located.
- Avoid positioning hand in area of blind spot. (Where edge of prism borders viable field of view). Position hand well into the prism area. This also gives the trainee additional exposure to increased eye movement.
- Often the trainee's initial exposure to viewing through prisms, without using the trainee's own hand, results in an experience of greater displacement. This is due to the lack of kinesthetic and proprioceptive information which is obtained when the trainee's hand is being used.
- Encourage the trainee to verify grasping mistakes by turning head and looking at displacement misjudgements.
- Instructor should place objects in different locations, up, down, in, out to encourage eye movement and adaptation to objects in all areas of the visual field.
- Encourage the trainee to verbalize and demonstrate the apparent and actual location of objects. By verbalizing and demonstrating the effects of displacement, the trainee will improve accuracy of grasping and adaptation to the displacement factor.
- Vary figure-ground effect.
- The trainee may demonstrate under-reaching in the initial portions of the eye-hand tasks. This is due to a slight amount of magnification which the prism provides. By encouraging the trainee to over-reach during the training phase this problem can be quickly overcome.
- Many types of objects can be used for training. For example: cube blocks from 4" to 1|2", books,pens, keys or common environmental objects of decreasing sizes.

OBJECTIVE: To refine eye-hand coordination while viewing through prism

PROCEDURE:

- While seated, trainee views through prism
- Instructor introduces increasingly smaller objects into the trainee's field of view
- Trainee grasps objects as quickly as possible
- As trainee becomes more proficient with eye-hand coordination, instructor varies position of objects and requires trainee to locate and grasp objects with greater speed
- Repeat above steps using a pen or other thin object. Instructor releases pen or thin object as soon as trainee makes contact with it

OBSERVATIONS:

- Speed and accuracy of distance judgement, while viewing through the prism, is the main goal in this state of training.
- Unlike previous steps, movement in and out of prism area should be avoided. The trainee is instructed to maintain viewing and confirm location of objects through the prism area.
- Eye movement and scanning through the prism area should continually be encouraged.
- As trainee's accuracy increases, reinforce this skill through the use of smaller objects.
- Continue to vary the positions from which objects are introduced, the speed at which they are moved and figure-ground effect.
- When dropping objects frequently, vary positions (i.e., horizontal, vertical, oblique).

OBJECTIVE: To demonstrate increased functional field awareness while viewing through prism.

PROCEDURE: *Note: In the following first 5 steps, trainee should wear prescriptive or plano lenses without prism.

- Trainee stands in middle of long hallway fixating on target 10 - 20 feet away
- Instructor walks past trainee in a straight line parallel to trainee's line of direction
- While continuing to fixate on target, trainee signals when instructor is visually detected
- Repeat step 2 with trainee keeping head still and performing searching eye movements to the side where instructor will pass. (eye movement should be performed in area where prism will be placed)
- Trainee signals when instructor is visually detected
- Prism is again placed on trainee's glasses
- Repeat step 2 with trainee fixating eye in prism
- Trainee signals when instructor is visually detected
- Trainee performs searching eye movements within the prism area
- Trainee signals when instructor is visually detected
- Trainee describes effects of both eye movement and prism use in increasing functional field awareness

OBSERVATIONS:

- This procedure serves to demonstrate the importance of eye movement in increasing visual efficiency as well as the effectiveness of the prism in enhancing visual field awareness.
  a. In both cases where the eye remains stationary, (with and without the prism) the trainee's ability to detect a person passing on the side is not as effective as when the person performs searching eye movements. Generally, eye movement enables the trainee to detect a person at 2 - 5 feet sooner.
  b. Without the prism, the trainee may detect a person passing on the side within 4 - 20 feet, depending on extent of visual field constriction and the efficiency of eye movement. With the prism, the trainee may detect that same person with ½ foot - 2 feet.
- This procedure may represent the first exposure to the functional potential of increased field awareness/capabilities when viewing through the prism. The instructor should encourage the trainee's description of the effects of eye movement and increased visual field awareness, to ensure trainee's understanding of the new visual capabilities.
- Instructor's movements should be on the side or in the area where the prism is placed. (e.g., if superior field loss use hanging objects, if inferior loss, use low-lying objects).
- For maximum peripheral awareness, trainee should be instructed to move eye as far into the prism area as possible.

- Initally, if the trainee, with head still, detects a person passing on the side within approx. 3 feet, one might suspect that temporal islands of vision exist. The trainee should be referred for clinical visual field tests to confirm and determine the extent of peripheral vision.
- Even if islands of vision are detected, in some cases, prism can be placed over these areas without effecting double vision (i.e., the trainee may suppress the peripheral vision and rely on sharper central vision through the prism). However, if the trainee has efficient scanning abilities and uses these functional areas of vison well, double vision may result if prism is placed over the island of vision.

OBJECTIVE: Exposure to prism use while moving through an indoor environment.

PROCEDURE:

- Trainee moves through long hallways while continuously viewing through prism. (If necessary, trainee uses instructor as sighted guide)
- Trainee visually detects and describes location of doorways, insets, intersecting corridors, etc.
- Trainee makes periodic tactual confirmation of objects viewed through prism
- Repeat previous steps until trainee reaches accurately for selected objects viewed through the prism

OBJECTIVE: To develop effective scanning patterns while moving through the environment.

PROCEDURE:

- Trainee travels through building and frequently seeks information through the prism
- Instructor encourages and reinforces trainee for periodic eye movement into the prism
- Instructor provides feedback when trainee either does not see or contacts a potential hazard which should have been detected through the prism.
- Instructor provides positive feedback when trainee detects potential hazards
- Trainee locates doorways and narrow passageways through the prism and visually estimates location and width
- Trainee tactually confirms estimation of location and width
- Continue practice with a variety of doors and narrow passageways until trainee accurately and smoothly negotiates them independently
- Complexity of environment is gradually increased with introduction of other people, more obstacles, etc.
- Encourage frequent scanning resulting in greater awareness of surrounding environment and avoidance of people and obstacle contact

OBJECTIVE: To refine prism use in indoor environments

PROCEDURE:

- Trainee independently travels in a variety of indoor settings such as classrooms, offices, corridors, libraries, etc.
- Trainee describes as many objects and environmental features as possible
- Instructor reinforces trainee for periodic scanning in and out of prism
- Though tactual reinforcement is gradually decreased, trainee confirms tactually when in doubt of exact location of object, door, etc.
- Instructor names a variety of objects in each of the different settings
- Trainee scans in and out of prism, locates, travels towards and grasps objects as quickly as possible
- Instructor exposes trainee to more indoor settings involving complex travel routes, stair travel, turns, etc. until trainee's confidence in these situations is increased
- Trainee travels up and down stairs without using prism (Prism use on stairs should be avoided due to confusion with depth perception)
- Trainee travels with increased ease and speed, avoiding object and people contact
- Instructor reinforces trainee for increased visual efficiency while traveling through indoor environments

OBSERVATIONS:

- At this point, the trainee should be more accustomed to enhanced field awareness and adjusting to the displacement factors. Frequently, there are spontaneous statements such as, "without the prism, I would have bumped into that, "or" I would have never seen that before." The Instructor can view this lesson procedure as documentation of skill acquisition as well as an opportunity for the trainee to build and reinforce confidence.
- Initially, when traveling through doorways, it may be necessary to reach out toward both sides of the doorway in order to accurately judge the width of the open passageway. This tactual confirmation will decrease as the trainee becomes more accustomed to moving while viewing through the prism.
- Tactual confirmation should not be as frequent as in initial lessons, since trainee should be making more automatic, compensatory adjustments to displacement experienced through the prism.
- Stress the need for continually calling attention to a variety of objects in the trainee's path. This will encourage and reinforce scanning.
- Avoidance of prism use on stairs or in the negotiation of any drop-off is stressed because prisms will not provide depth perception. In fact, the negotiation of stairs will only be more difficult looking through the prism, as the location of steps will be displaced. The trainee should be instructed to do as anyone else would on stairs (i.e., looking down to determine the exact location of the steps). Prisms may be used, however, to assist in the detection of handrails.

OBJECTIVE: Exposure to outdoor environment while viewing through the prism

PROCEDURE:

- While scanning in and out of prism, trainee walks through a quiet residential setting
- Trainee verbalizes location of objects (e.g., trees, poles, mail boxes, etc. seen through the prism)
- Trainee obtains periodic tactual feedback to reinforce location of objects
- Trainee visually trails fence or bush while viewing through prism
- Trainee signals break in fence or bush, which may indicate opening or intersecting walk
- While moving, trainee observes pedestrian flow, avoiding contact with anyone passing in or crossing line of travel
- At street corners, trainee negotiates curbs and crossings without using the prism(prism use at street crossings should be avoided due to difficulties in speed/distance judgements)
- Trainee continues to travel, coordinating movement and prism use

OBSERVATIONS:

- Because of the additional variables an outdoor environment presents (e.g., movement, volume and variety of information, etc.), lessons in this area should proceed slowly at first, to allow trainee to become gradually adjusted to prism use in more complex environments
- Because the outdoor environment has more variables such as low, overhanging tree branches and vehicular traffic which may cross in front of the trainee, the instructor must provide continued exposure to enable the trainee to develop the ability to distinguish between actual objects or movement across the line of travel and the perceived displacement of objects and people while viewing through the prism.
- Encourage more visual environmental awareness. For example, when trainee detects a pole, instruct trainee to visually follow the pole until a street light, sign, etc. is located. Stress as much scanning as possible for increased awareness of the environment. Many people with restricted fields are accustomed to using their vision for safety and orientation purposes alone. Frequently, individuals using prisms will make statements such as "I can now relax and enjoy more things than I ever noticed before" or "Now I can take in more information with less effort. Before, I was always busy concentrating on just getting by with my vision."
- Many individuals with restricted fields frequently report difficulty with sunlight and problems adapting to changes in lighting conditions. Prism use frequently compounds lighting difficulties and can produce additional glare. The use of absorptive lenses is recommended to alleviate these problems. For individuals not requiring prescriptive lenses, prisms can be affixed to the absorptive lenses. For those requiring prescriptive lenses, absorptive lenses can be worn over their Rx.

- In this lesson, inform trainee that you will periodically attempt to come from behind and cross trainee's line of travel. This encourages trainee to frequently scan into the prism to detect other pedestrians and avoid contact.
- In addition to concentrating on objects in the immediate environment, encourage trainee to make estimation of objects, people, etc. in the distance (e.g., parked cars and moving pedestrians across the street). Note the apparent displacement of an object increases as the distance between the object and viewer increases.
- Prism use should be avoided when negotiating street crossings. It is difficult to determine, (due to "Jack in the Box" effect) if car turning or crossing trainee's line of travel is either displaced by the prism or actually turning or cutting in front of the trainee. Prisms can be used to increase awareness of automobile or traffic flow. However, when negotiating the crossing any, location or distance/speed judgement should be performed using trainee's unaided field of view. Trainee should be instructed to scan as others do when crossing streets (i.e., turning head in both directions before making any judgements).

OBJECTIVE: To travel in more complex outdoor environment while viewing through prism

PROCEDURE:

- While scanning in and out of prism, trainee walks through medium business area
- Trainee describes location of objects such as parking meters, poles, news stands, etc.
- While viewing through prism, trainee visually follows building line, indicating doorways and openings between buildings as well as describing store fronts and display windows
- While moving, trainee observes pedestrian flow and attempts to avoid contact with anyone passing in or crossing line of travel
- Trainee stands at end of building line, views through prism, and observes people passing and turning the corner
- At street corners, trainee negotiates curbs and crossings without using the prism (prism use at street crossings should be avoided)
- Trainee continues to travel, coordinating movement and prism use, while avoiding objects and people contact

OBJECTIVE: Familiarization to commercial store setting while viewing through prism

PROCEDURE:

- Trainee travels through relatively uncluttered stores (e.g., stores with wide aisles and few shoppers)
- While viewing through prism, trainee verbalizes information about store, (e.g., types of displays, width of aisles, etc.)
- Trainee moves through store, scanning in and out of prism, avoiding contact with other shoppers, edges of counters, offset displays, etc.
- To increase trainee's efficiency, instructor emphasizes need to adjust walking speed and frequency of eye scanning.
- Trainee travels through congested stores, (e.g., stores with narrow and/or cluttered aisles, many shoppers, etc.)
- Repeat steps 2 through 4
- Trainee independently negotiates a variety of stores, locating specific items and making purchases

OBJECTIVE: To coordinate prism use with negotiation of public transportation and independent travel through congested areas

PROCEDURE:

- Trainee rides bus, trolley, train and/or subway to downtown or congested area
- While moving, trainee observes pedestrian flow and attempts to avoid contact with anyone passing in or crossing line of travel
- Scanning in and out of prism, trainee describes various store fronts, displays, pedestrian activity, etc.
- At street corners, trainee negotiates curbs and crossings without using prism
- Trainee travels in a congested department store initially, if necessary, trainee uses instructor as sighted guide
- While scanning in and out of prism, trainee describes shoppers crossing line of travel, width of aisles, location of counters, offset displays, clothes racks, etc.
- Trainee travels independently through store and, if necessary, instructor gives trainee verbal or physical assistance to avoid people and object contact
- Instructor provides feedback when trainee either does not see or contacts a potential hazard which should have been detected through the prism
- Instructor provides positive feedback when trainee detects and avoids potential hazards
- Trainee negotiates escalators without using prism (prism use should be avoided on escalators)
- Trainee negotiates elevators, and utilizes prisms to avoid contact with other shoopers entering or exiting elevators
- Trainee is given a list of objectives (e.g., locating items in various departments) and is required to find these items utilizing escalators, elevators and stairs
- Trainee independently returns to starting point, through use of public transportation
- Instructor reinforces trainee for increased visual efficiency while traveling through congested area

APPENDIX D

LOW VISION TRAINING NEEDS SURVEY
FOR INDIVIDUALS SERVING VISUALLY IMPAIRED POPULATIONS

The PA College of Optometry, Low Vision Research & Training Center will be conducting a regional training workshop in November. Your completion of this form will assist us in planning learning opportunities which best match your needs. Please return it to your low vision training coordinator by June 10th. Thank you!

SECTION I

Name: ______________________________

Position: ______________________________

Organization: ______________________________

Address: ______________________________

____

____

Supervisor's Name ______________________________

___ Total Caseload Size

___ Average Daily Caseload

Estimated Caseload Distribution:

___% Totally Blind
___% Low Vision
___% Other
100%

___% Elderly
___% Adult
___% Children
100%

___ Years of experience working with visually impaired individuals.

1. Level of preparation in meeting the needs of my: (check one)

Totally blind caseload	__good	__adequate	__insufficient
Low vision caseload	__good	__adequate	__insufficient

2. Three major problems I experience in working with low vision clients are:

1. ______________________________
2. ______________________________
3. ______________________________

3. A regional training workshop would be most useful for me if it included: ______________________________

____

____

____

SECTION II

Please read the topics below and using a scale of 1 (low) to 5 (high) rate your level of knowledge on that topic. Then repeat the process in terms of the topic's relevance to your job (i.e. is it information that would help you perform your job better?)

	Knowledge	Relevance to my job
	(1 low to 5 high)	
Part 1: LOW VISION AND ITS EFFECTS		
1. Basic anatomy and optics of the eye	____	____
2. Common low vision diseases & conditions	____	____
3. Functional implications of low vision	____	____
4. Psycho-social implications of low vision	____	____
Part 2: LOW VISION ASSESSMENTS		
5. Clinical low vision examination	____	____
6. Functional interpretations of eye reports	____	____
7. Functional vision assessments in the following situation:		
a) at home	____	____
b) at work	____	____
c) at school	____	____
d) travel	____	____
e) other	____	____
Part 3: LOW VISION TRAINING		
8. Vision stimulation	____	____
9. Increasing visual efficiency without optical aids	____	____
10. Training with near optical aids	____	____
11. Training with distance optical aids	____	____
12. Training with visual field enhancement systems (e.g., fresnel prisms, reversed telescopes)	____	____
Part 4: SERVICE DELIVERY		
13. Interdisciplinary roles and/or approaches	____	____
14. Interagency referrals and follow-ups	____	____

(1 low to 5 high)

	Knowledge	Relevance to my job
15. Working with selected low vision populations:		
a) children	___	___
b) adult	___	___
c) elderly	___	___
d) multi-handicapped	___	___
e) learning disabled	___	___
16. Environmental and task modifications for low vision individuals		
a) at home	___	___
b) at work	___	___
c) at school	___	___
d) travel	___	___
e) other	___	___
17. Marketing strategies for job placement of low vision individuals	___	___

18. Other (list) ______________________________

____

____

____

____

____

LOW VISION TRAINING NEEDS SURVEY
FOR ADMINISTRATORS/SUPERVISORS

The PA College of Optometry, Low Vision Research & Training Center will be conducting a regional training workshop in November. Your completion of this form will assist us in planning learning opportunities which best match the needs of your staff. Please return it to your low vision training coordinator by June 10th. Thank you!

SECTION I

Name:________________________________

Position:____________________________

Organization:________________________

Address:_____________________________

____

____

Give Estimate for your Staff

___ Total Caseload Size

___ Average Daily Caseload

Caseload Distribution:

___%	Totally Blind	___%	Elderly
___%	Low Vision	___%	Adults
___%	Other	___%	Children
100%		100%	

___ Your staff's average years of experience working with visually impaired individuals.

1. Level of preparation in assisting my staff in meeting the needs of their

Totally blind caseload	__good	__adequate	__insufficient
Low vision caseload	__good	__adequate	__insufficient

2. Three major problems my staff experiences in working with low vision clients are:

   1.____

   2.____

   3.____

3. A regional training workshop would be most useful for my staff if it

   included:_______________________________________

   ____

   ____

   ____

SECTION II

Please read the topics below and using a scale of 1 (low) to 5 (high) rate your staff's level of knowledge on that topic. Then repeat the process in terms of the topic's relevance to your staff's job areas (i.e. is it information that would help them perform their job better?)

	Knowledge	Relevance to their jobs
	(1 low to 5 high)	
Part 1: LOW VISION AND ITS EFFECTS		
1. Basic anatomy and optics of the eye	____	____
2. Common low vision diseases & conditions	____	____
3. Functional implications of low vision	____	____
4. Psycho-social implications of low vision	____	____
Part 2: LOW VISION ASSESSMENTS		
5. Clinical low vision examination	____	____
6. Functional interpretations of eye reports	____	____
7. Functional vision assessments in the following situations:		
a) at home	____	____
b) at work	____	____
c) at school	____	____
d) travel	____	____
e) other	____	____
Part 3: LOW VISION TRAINING		
8. Vision stimulation	____	____
9. Increasing visual efficiency without optical aids	____	____
10. Training with near optical aids	____	____
11. Training with distance optical aids	____	____
12. Training with visual field enhancement systems (e.g., fresnel prisms, reversed telescopes)	____	____
Part 4: SERVICE DELIVERY		
13. Interdisciplinary roles and/or approaches	____	____
14. Interagency referrals and follow-ups	____	____

NEEDS SURVEY RESULTS
REGIONAL LOW VISION TRAINING NEEDS SURVEY

RESPONDENTS

The respondents to the Regional Low Vision Training Needs Survey included the following-

Total Number	230
Supervisors	14 - 6%
Administrators	26 - 11%
Rehabilitation Counselors	71 - 31%
Rehabilitation Teachers	37 - 16%
O & M Specialists	22 - 10%
Social Workers	6 - 3%
Others	54 - 23%

The caseload distributions ranged for service providers from 0 to 400 with an average reported caseload of 93. In examining the distributions of these caseloads there were 62% low vision, 22% totally blind and 17% other. The distribution by age range included 31% elderly, 51% adult and 18% children. As far as respondents' levels of preparation for serving totally blind and low vision individuals, they rated themselves as less prepared to serve their low vision caseload.

PROBLEMS EXPERIENCED BY RESPONDENTS IN SERVING LOW VISION PERSONS

Problems were grouped under professionals' lack of knowledge, client related problems, service delivery problems and other. Highlights from these problems include the following-

Professional Lack of Knowledge

89.00	Functional Implications
41.00	Aids and Optics
13.00	Low vision Clinical Exam & Functional Interpretations
13.00	Functional Vision Assessments
5.00	Vision Stimulation
5.00	Other Lacks of Knowledge
4.00	Training in Use of Vision
3.00	Referral Process and Timing
1.00	Job Placement and Marketing

Client Problems

64.00	Affective
19.00	Cognitive
15.00	Physical
14.00	Mobility
15.00	Technical
6.00	Social

2.00	Vocational
1.00	Self-Care
1.00	Other Client Related Problems

Service Delivery System Problems

44.00	Low Vision Services - Lacking, Untimely
34.00	Financial
15.00	Aids
5.00	Other Professionals' Lack of Knowledge
5.00	Other Service Delivery System Problems
2.00	Public Relations
2.00	Instructional Information
1.00	Vocational

Other Problems

9.00	Counseling
2.00	Multi-Handicaps
1.00	Vocational
1.00	Adaptions
1.00	Understanding of Fee Schedules
1.00	Limited Experience
1.00	Individualization of Low Vision

GAPS BETWEEN KNOWLEDGE AND JOB RELEVANCE

The following items were identified as the largest gaps between knowledge and job relevance among the respondents to this questionnaire. These included:

	Knowledge	Relevance	Gap
1. Training with visual field enhancement systems	1.80	3.27	1.47
2. Training without optical aids	2.40	3.83	1.43
3. Functional implications of low vision	3.29	4.56	1.27
4. Training with near optical aids	2.64	3.91	1.27
5. Vision stimulation	2.28	3.47	1.19
6. Working with multi-handicapped	2.81	4.00	1.19
7. Modifying the work environment	2.39	3.56	1.17
8. Training with distance optical aids	2.56	3.70	1.14
9. Psychosocial aspects of low vision	3.31	4.40	1.09
10. Functional interpretations of the eye report	3.30	4.39	1.09

11.	Working with the learning disabled	2.22	3.29	1.07
12.	Environmental modifications for travel	2.57	3.64	1.07
13.	Environmental modifications at home	2.79	3.84	1.05
14.	Low Vision examination	2.82	3.82	1.00
15.	Marketing strategies	2.06	3.06	1.00

TRAINING RECOMMENDATIONS

Paralleling closely with the identified problems and gap areas were the following recommendations:

-Over 85 individuals were interested in information on aids with emphasis on new and advanced ones.

-Over 21 identified a strong interest in generic low vision training. (Covering the whole spectrum)

-Approximately 20 individuals emphasized information functional implications and common low vision diseases and conditions.

-The next highest was emphasis on vocational aspects of low vision including career planning, vocational training, self-employment and job placement.

-16 emphasized counseling. Many individuals were concerned about how to motivate clients, how to assist them with adjustment to visual loss and in communicating about their disability and their abilities.

-The next highest category was on functional interpretations of the eye report, followed by training and visual stimulation.

-The last large category, receiving a fair number of comments, was on vehicles for assuring follow-up of services in the area of low vision.

REGIONAL LOW VISION TRAINING NEEDS SURVEY

Agencies for the Blind...: A Comparison

The chart below compares participating rehabilitation agencies in participant responses to a rating of low vision topics, first by their level of knowledge, and second, by the relevance of that topic to their respective jobs. The rating below represents the gap between the two. The number by the agency's initials represents the number participating in the survey.

TOPICS	Agencies for the Visually Impaired				
	PA BVS (90)	VA DVH (87)	NJ CB (47)	DE DVI (11)	Regional Average
1.0 LOW VISION AND ITS EFFECTS					
1.1 Basic anatomy & optics of the eye	0.77	0.66	0.55	0.37	0.75
1.2 Common low vision diseases & conditions	0.76	0.77	1.00	0.46	0.80
1.3 Functional Implications	1.42	1.10	1.10	1.00	1.26
1.4 Psychosocial Implications	1.16	1.03	1.04	0.73	1.08
2.0 LOW VISION ASSESSMENTS					
2.1 Clinical Low Vision Exam	1.10	0.90	0.68	0.55	1.00
2.2 Functional Interpretations	1.20	0.91	0.77	0.46	1.07
2.3 Functional Assessments (Home)	0.93	0.76	0.68	0.18	0.83
2.4 Functional Assessments (Work)	1.22	0.42	0.83	0.00	0.90
2.5 Functional Assessments (School)	1.07	0.42	0.62	0.37	0.80
2.6 Functional Assessments (Travel)	1.12	0.63	0.83	0.18	0.91
2.7 Functional Assessments (Other)	0.54	0.22	0.40	0.19	0.38

TOPICS	Agencies for the Visually Impaired				
	PA BVS (90)	VA DVH (87)	NJ CB (47)	DE DVI (11)	Regional Average
3.0 LOW VISION TRAINING					
3.1 Vision stimulation	1.31	1.14	1.13	0.73	1.20
3.2 Training without optical aids	1.55	1.40	1.51	1.18	1.41
3.3 Training with near optical aids	1.45	1.15	1.32	0.46	1.25
3.4 Training with distance optical aids	1.32	0.93	1.21	0.73	1.13
3.5 Training with visual field enhancement systems	1.70	1.27	1.39	1.09	1.44
4.0 SERVICE DELIVERY					
4.1 Interdisciplinary roles	0.77	0.64	0.78	0.46	0.74
4.2 Interagency referrals and follow-up	0.53	0.43	0.81	0.19	0.54
5.0 WORKING WITH SELECTED POPULATIONS					
5.1 Children	0.60	0.17	0.30	0.09	0.32
5.2 Adult	1.20	0.29	0.81	0.27	0.77
5.3 Elderly	1.04	0.29	0.74	0.27	0.67
5.4 Multi-handicapped	1.44	0.97	1.15	0.27	1.18
5.5 Learning disabled	1.27	0.94	0.94	0.27	1.06
6.0 ENVIRONMENTAL & TASK MODIFICATIONS					
6.1 Home	1.25	0.91	0.93	0.09	1.04
6.2 Work	1.40	0.81	1.00	0.18	1.19
6.3 School	0.98	0.78	0.83	0.28	0.90
6.4 Travel	1.30	0.75	1.02	0.63	1.05
6.5 Other	0.51	0.30	0.45	0.00	0.40
7.0 MARKETING STRATEGIES	0.89	0.82	1.14	0.37	1.00

REGIONAL LOW VISION TRAINING NEEDS SURVEY

Other Rehabilitation Agencies...: A Comparison

The chart below compares participating rehabilitation agencies in participant responses to a rating of low vision topics, first by their level of knowledge, and second, by the relevance of that topic to their respective jobs. The rating below represents the gap between the two. The number by the agency's initials represents the number participating in the survey.

TOPICS	Other Rehabilitation Agencies					
	MD DVR (49)*	WV DVR (13)	DE DVR (13)	DC VRSA (6)	PA OVR (2)	Regional Average
1.0 LOW VISION AND ITS EFFECTS						
1.1 Basic Anatomy & optics of the eye	0.39	1.23	0.34	1.00	1.00	0.75
1.2 Common low vision diseases & conditions	1.00	1.08	0.50	0.50	0.00	0.80
1.3 Functional implications	1.47	1.30	1.08	1.50	2.50	1.26
1.4 Psychosocial implications	1.34	1.16	0.84	0.83	3.00	1.08
2.0 LOW VISION ASSESSMENTS						
2.1 Low Vision Exam	1.19	1.15	0.75	0.83	1.00	1.00
2.2 Functional Interpretation	1.59	1.15	1.33	0.84	1.50	1.07
2.3 Functional Assessments (Home)	1.53	1.00	0.67	0.33	1.00	0.83
2.4 Functional Assessments (Work)	1.77	1.07	1.58	0.33	2.50	0.90
2.5 Functional Assessments (School)	1.43	0.92	1.17	0.67	1.00	0.80
2.6 Functional Assessments (Travel)	1.39	1.07	1.16	0.33	0.50	0.91
2.7 Functional Assessments (Other)	0.72	0.46	0.34	0.33	0.00	0.38

TOPICS	Other Rehabilitation Agencies					
	MD DVR (49)*	WV DVR (13)	DE DVR (13)	DC VRSA (6)	PA OVR (2)	Regional Average
3.0 LOW VISION TRAINING						
3.1 Vision stimulation	1.13	1.23	0.59	1.33	3.00	1.20
3.2 Training without optical aids	1.31	1.69	0.50	0.66	3.00	1.41
3.3 Training with near optical aids	1.23	1.61	0.67	0.67	4.00	1.25
3.4 Training with distance optical aids	1.13	1.54	0.58	0.83	4.00	1.13
3.5 Training with visual field enhancement systems	1.29	1.61	0.58	1.33	3.50	1.44
4.0 SERVICE DELIVERY						
4.1 Interdisciplinary roles	1.11	0.77	0.83	0.33	1.50	0.74
4.2 Interagency referrals and follow-up	1.35	1.07	0.34	0.33	1.50	0.54
5.0 WORKING WITH SELECTED POPULATIONS						
5.1 Children	0.16	0.31	0.17	0.16	0.00	0.32
5.2 Adult	1.43	0.84	0.83	0.50	2.50	0.77
5.3 Elderly	0.75	0.77	0.83	0.33	0.00	0.67
5.4 Multi-handicapped	1.60	1.08	1.42	0.50	1.50	1.18
5.5 Learning disabled	1.33	0.77	1.17	0.67	3.50	1.06
6.0 ENVIRONMENTAL & TASK MODIFICATIONS						
6.1 Home	1.24	1.46	0.25	1.16	1.50	1.04
6.2 Work	1.90	1.62	1.91	0.84	3.50	1.19
6.3 School	1.43	1.31	0.91	0.84	1.50	0.90
6.4 Travel	1.39	0.92	0.91	0.83	0.00	1.05
6.5 Other	0.45	0.61	0.41	0.33	0.00	0.40
7.0 MARKETING STRATEGIES	1.96	1.69	2.00	0.66	3.00	1.00

* Over 150 surveys were completed by MD Rehabilitation Counselors. However, only 49 served more than 10% visually impaired. The rest are treated separately.

LOW VISION TRAINING NEEDS SURVEY
FOR EYE CARE SPECIALISTS

The PA College of Optometry, Low Vision Research & Training Center is planning to conduct a Low Vision Training Workshop for Eye Care Specialists. Your completion of this form will assist us in planning learning opportunities which best match your needs. Please return it within 5 days.

SECTION I

Name: ______________________________

Address: ______________________________

Years of experience as an eye care specialist

Average weekly patientload _____

Patientload distribution:

___% Normal Vision	___% Elderly
___% Low Vision	___% Adults
___% Total Blindness	___% Children
100%	100%

Patientload Distribution:

__% congenital ocular disorders
__% macular degeneration
__% retinitis pigmentosa
__% diabetic retinopathy
__% cataracts
__% glaucoma
__% optic atrophy
__% corneal problems
__% other (specify) ______________

____

100%

1. Level of preparation in serving my patients;

Normal Vision	__good	__adequate	__insufficient
Low Vision	__good	__adequate	__insufficient
Total Blindness	__good	__adequate	__insufficient

2. Three major problems I experience in working with low vision patients are (if applicable):

a. ____

b. ____

c. ____

3a. How useful would low vision information and/or training be to your practice?

__very useful   __somewhat useful   __not useful

3b. A Low Vision Training Workshop would be most useful to me if it included:

____

____

____

SECTION II

Please read the topics below and using a scale of 1 (low) to 5 (high) rate your level of knowledge on that topic. Then repeat the process in terms of the topic's relevance to your practice (i.e. is it information that would help you perform your job better?)

	Knowledge	Relevance to my practice
	(1 low to 5 high)	
Part 1: LOW VISION AND ITS EFFECTS		
1. Basic anatomy and optics of the eye	____	____
2. Common low vision diseases & conditions	____	____
3. Functional implications of low vision	____	____
4. Psycho-social implications of low vision	____	____
Part 2: LOW VISION ASSESSMENTS		
5. Clinical low vision examination	____	____
6. Prescribing aids for specific patient goals		
a) Telescopic lenses	____	____
b) Telemicroscopes	____	____
c) Microscopes	____	____
d) High powered bifocals	____	____
e) Magnifiers	____	____
f) Visual field enhancement systems	____	____
g) Nonoptical aids	____	____
7. Functional vision assessments for the following situations:		
a) home	____	____
b) work	____	____
c) school	____	____
d) travel	____	____
e) other	____	____
Part 3: LOW VISION TRAINING		
8. Vision stimulation	____	____
9. Increasing visual efficiency without optical aids	____	____
10. Training with near optical aids	____	____
11. Training with distance optical aids	____	____
12. Training with visual field enhancement systems (e.g., fresnel prisms, reversed telescopes)	____	____

	Knowledge	Relevance to my practice
	(1 low to 5 high)	
PART 4: SERVICE DELIVERY		
13. Interdisciplinary roles and/or approaches	____	____
14. Making referrals and following up	____	____
15. Working with selected low vision populations:		
a) children	____	____
b) adult	____	____
c) elderly	____	____
d) multi-handicapped	____	____
e) learning disabled	____	____
16. Environmental and task modificiations for low vision individuals		
a) at home	____	____
b) at work	____	____
c) at school	____	____
d) travel	____	____
e) other	____	____
17. Resources for		
a) obtaining low vision aids	____	____
b) training patients in use of low vision aids	____	____
c) financial assistance for purchases of aids or services	____	____
d) helping low vision patients and their families adjust to low vision	____	____

e) other (please specify) ______________

____

____

18. Other (list) ______________________

____

____

____

____

____

LOW VISION TRAINING NEEDS SURVEY
FOR EYE CARE SPECIALISTS
SUMMARY

Thirty-four respondents to an Eye Care Specialists Survey conducted in Pennsylvania ranged from one to forty-five years of experience. Their level of preparation for serving individuals with normal vision was rated consistently - good, for low vision - barely adequate, and for totally blind - insufficient.

Responses to problems in working with low vision patients centered on financial concerns, limited knowledge, limited equipment, limited time, and patient-concerns (costs, acceptance of aids, inability to adapt to low vision aids, fear of failure, limited motivation, poor vision discrimination, etc.), as well as concerns related to the state of the art and access of the eye care specialists (and/or the patient) to necessary resources. See Attachment 1 for complete list.

Recommendations for the Low Vision Training Workshop emphasized low vision aids especially new ones, clinical procedures, referral sources, equipment sources, financial sources, effective scheduling, and hands-on activities.

When knowledge of low vision topics were compared with relevance to the eye care specialist's job, the areas with greatest gaps included-

- Resources for financial assistance for purchases of aids, or services
- Increasing visual efficiency without optical aids
- Training with visual field enhancement systems
- Prescribing non-optical aids for specific patient goals

- Vision stimulation
- Training with near optical aids
- Training with distance optical aids
- Prescribing low vision aids such as telemicroscopes and visual field enhancement systems
- Resources for helping low vision patients and their families adjust to low vision

ATTACHMENT 1

PROBLEMS EXPERIENCED BY EYE CARE SPECIALISTS IN SERVING LOW VISION PERSONS

- Inconvenience of trial fitting telescopic lenses
- Transit and mobility outside of institutional pattern
- Cost and ability to pay
- Effective scheduling of office space
- Accurate prediction of results
- Time requirements (to counsel patients, to exam and prescribe, etc.)
- Expense of aids
- Elderly patients acceptance of aids
- The high frustration level of these patients
- Knowing what forms of financial assistance are available for aids
- Being certain patients are maximizing available low vision resources
- Obtaining satisfactory sources for referral to state agencies
- Very poor service on obtaining fabricated visual aids
- Inadequate experience in insurance reimbursement
- Motivation
- Enough Equipment
- Cooperation with the medical community
- Lack of equipment and/or sources of equipment
- Lack of knowledge (e.g. best device to dispense)
- Lack of experience
- Limited time to counsel patient
- Best device to dispense - ? what's best for what
- Their mobility to realize that they cannot attain such as they once had i.e. in cases of macular degeneration or choroidal sclerosis, choro retinitis etc. that has eroded thru the macula
- Senile inability to adapt to low vision aids
- Inadequate materials to utilize my abilities
- Lack of patients to enable me to sharpen skills
- Insufficient magnification - available aids
- Expense of the aids
- Motiviation
- Unrealistic expectations
- Time
- Variation in low vision aids etc.
- Inability to communicate problem no matter how much time I spend
- Poor results
- Patient satisfaction
- High fees for service
- I know of no competent low vision expert to whom I could confidently refer patients and who practices within a reasonable distance
- Inadequacy and unfamiliarity with appropriate equipment
- Time consuming care-compensation inadequate or unavailable
- Patient lack of funds

- Reluctance to keep referral appointments
- Patient fear of failure
- Equipment too heavy
- Cost
- Finding financial assistance for patients
- Getting opthalmologists to refer for all visually impaired patients
- Patient rarely motivated to use device prescribed, pertains to elderly
- Financial support for low vision patients for appropriate aids
- Availability of low vision aids
- Poor funding by insurance carriers
- Widespread advertising of aids with little value, i.e. "Honeybee"
- Low referral rate from optometrists
- Lack of accurate procedures
- Lack of sophisticated equipment
- Poor patient vision discrimination
- Their expectations
- Giving them reading acuity
- Deterioration in visual acuity from trial frame to actual Rx
- Visual Acuity Testing
- Equipment sources
- Referral sources
- Lack of knowledge of available options

TRAINING RECOMMENDATIONS

- Inconvenience of trial fitting telescopic lenses
- Transit and mobility outside of institutional pattern
- Cost and ability to pay
- Effective scheduling
- Survey of most recent developments-medical as well as optical
- Information on availability and cost of low vision aids
- Low vision aids and usage for general population-this would not include extremely complex or expensive procedures
- The areas where I am most weak (Parts III and IV of the survey) and an update on the latest available aids
- Virtually anything beyond the typical elementary information normally presented
- Much needed clinical experience
- Basic information and instruction
- Information on subjects outlined on sheets following this
- When to use, what type of device
- A usable routine for exam and work-up and handling devices
- Hands-on, practical demonstration of actual correcting of elderly (senile) patients who make up the bulk of my low vision practice
- Availability and training in use of low vision aids
- Prismatic corrections
- Would prefer to refer
- Not enough exposure to comment
- Standard (most used) clinical procedures and low vision aids

- Techniques for case-finding, rapid evaluation and appropriate referral
- Therapy of the uncomplicated low vision patient by the general practitioner
- Reimbursement sources for low vision work
- Funding, fears of failure, and client's reluctance to keep referral appointments, plus latest techniques and equipment
- A training session for my assistants on Saturday to help them better train my patients and their systems
- Low vision work-up. Availability of low vision acuity charts and review of metric notation for acuity documentation and magnification requirements
- "Hands-on" work with newer aids (Bioptic systems, etc.)
- Comprehensive list of available equipment, aids, support
- Research results of new low vision aids
- New training techniques for low vision patients
- Time to talk with other low vision practitioners
- Access to low cost devices
- Psychology of handling the patients before and after
- Low cost of low vision aids
- Technique of subjects with low vision aids
- Visual acuity testing
- Equipment sources
- Referral sources
- Most successful solution to most common problems

REGIONAL LOW VISION TRAINING WORKSHOP

INTERMEDIATE TRACT

Wednesday	Room	Program	Speaker
12:15-2:00	Salon A, B	WELCOME LUNCHEON WITH KEYNOTE SPEAKER "A Look Back and a Look Ahead"	Dr. Randall Jose
2:15-3:30	Jones	COMMON EYE DISEASES - IMPACT ON THE VISUAL SYSTEM	Dr. Robert Ruggiero
3:30-3:30		BREAK	
3:45-5:00	Jones	FUNCTIONAL IMPLICATIONS OF COMMON EYE DISEASES & SUGGESTIONS FOR REMEDIATION	Gale Watson
5:00-6:00	Jones	FILM FESTIVAL	
6:00-7:00	Salon A, B	EXHIBITORS' RECEPTION	
7:00-9:00	Jones	FILM FESTIVAL	
Thursday			
8:30-9:45	Salon A	OPTICAL AIDS	Dr.Charles Hollander
9:45-11:00	Terrace	HANDS-ON EXPERIENCES WITH OPTICAL AIDS	Audrey Smith, et al
11:00-11:15		BREAK	
11:15-12:30	Salon A	TRAINING WITH NEAR AIDS	Mark Steciw
12:30-1:30	Lounge	BUFFET LUNCHEON	
1:30-2:45	Salon A	TRAINING WITH DISTANCE AIDS	Ann Barber
2:45-3:00		BREAK	
3:00-4:15	Salon A, B, C	ENVIRONMENTAL ADAPTATIONS FOR LOW VISION INDIVIDUALS (WORK/TRAVEL/HOME)	Dr. Shelley Miles Audrey J. Smith Gale Watson
4:15-5:00	Salon A	EXHIBITS, FILMS	
5:00-7:00	Salon A	FILM FESTIVAL(Optional)	
Friday			
8:30-9:45	Salon B	PROBLEM-SOLVING - IDEA SHARING	Dr.Anthony DiStefano et al
9:45-10:00		BREAK	
10:00-11:30	Salon B, C	PSYCHOSOCIAL ASPECTS OF LOW VISION	Dr. Richard Welsh
11:30-12:00	Salon B, C	ACTION PLANNING	Audrey J. Smith
12:00-12:30	Salon B, C	A LOOK BACK AND A LOOK AHEAD	Staff

REGIONAL LOW VISION TRAINING WORKSHOP

ADVANCED TRACT

Wednesday	Room	Program	Speaker
12:15- 2:00	Salon A, B	WELCOME LUNCHEON WITH KEYNOTE SPEAKER "A Look Back and A Look Ahead"	Dr. Randall Jose
2:15- 3:00	Salon C	OVERVIEW OF NATIONAL RESEARCH AND TRAINING CENTERS • Pennsylvania College of Optometry Low Vision Research & Training Center	Dr. Anthony DiStefano
		• Mississippi State University Blindness & Low Vision Research & Training Center	Dr. Shelly Miles
3:00- 3:30	Salon C	CURRENT LOW VISION RESEARCH: A. Advances in Eccentric Viewing Evaluation & Training	Gale Watson
3:30- 3:45		BREAK	
3:45- 4:15	Salon C	B. Advances in Visual Field Enhancement Systems Evaluation & Training	Audrey J. Smith
4:15- 5:00	Salon C	C. Illumination & Color Contrast Research for Increasing Worker Productivity	Dr. Shelly Miles
5:00- 6:00	Jones	FILMS FESTIVAL	
6:00- 7:00	Salon A, B	EXHIBITORS' RECEPTION	
7:00- 9:00	Jones	FILM FESTIVAL	
Thursday			
8:30-11:00	Salon B, C	ADVANCES IN OPTICAL AIDS • Bioptic Devices • Visual Field Enhancement Systems: -Fresnel Prisms -Reversed Telescopes -New Cylindrical Lenses	Dr. Randall Jose
11:00-11:15		BREAK	
11:15-12:30	Salon C	REHABILITATION SERVICE DELIVERY PROBLEMS CLARIFICATION & PLANNING	Laura A. Edwards
12:30- 1:30	Lounge	BUFFET LUNCHEON	
1:30- 2:45	Terrace	HANDS-ON EXPERIENCES WITH NEW OPTICAL AIDS	Audrey Smith, et al
2:45- 3:00		BREAK	
3:00- 4:15	Salon A, B, C	ENVIRONMENTAL ADAPTATIONS FOR LOW VISION INDIVIDUALS (WORK/TRAVEL/HOME)	Dr. Shelly Miles Audrey J. Smith Gale Watson
4:15- 5:00	Salon C	INTERDISCIPLINARY PROBLEM SOLVING Part I - Explorations in Creativity	Laura Edwards, et al
5:00- 7:00	Salon A	FILM FESTIVAL (Optional)	

(Continued)

Friday	Room	Program	Speakers
8:30- 9:45	Salon C	INTERDISCIPLINARY PROBLEM SOLVING Part II - Explorations in Creativity	Laura Edwards, et al
9:45-10:00		BREAK	
10:00-11:30	Salon B, C	PSYCHOSOCIAL ASPECTS OF LOW VISION	Dr. Richard Welsh
11:30-12:00	Salon B, C	ACTION PLANNING	Audrey J. Smith
12:00-12:30	Salon B, C	A LOOK BACK AND A LOOK AHEAD	Staff

REGIONAL LOW VISION TRAINING WORKSHOP

EYE CARE SPECIALISTS TRACT

Wednesday	Room	Program	Speaker
12:15- 2:00	Salon, A, B	WELCOME LUNCHEON WITH KEYNOTE SPEAKER "A Look Back & A Look Ahead"	Dr. Randall Jose
2:15- 4:15	Terrace	THE LOW VISION EXAMINATION Current Techniques, Approaches & Resources	Dr. Randall Jose
3:30- 3:45		BREAK	
4:15- 5:00	Terrace	LOW VISION FUNDING & REHABILITATION RESOURCES - Panel	Joseph Snyder Norma Krajczar Dr. Deborah Budick
5:00- 6:00	Jones	FILM FESTIVAL	
6:00- 7:00	Salon A, B	EXHIBITORS' RECEPTION	
7:00- 9:00	Jones	FILM FESTIVAL	
Thursday			
8:30-11:00	Salon B, C	ADVANCES IN OPTICAL AIDS - PART I • Bioptic Devices • Visual Field Enhancement Systems: -Fresnel Prisms -Reversed Telescopes -New Cylindrical Lenses	Dr. Randall Jose
11:00-11:15		BREAK	
11:15-12:30	Salon B Terrace	ADVANCES IN OPTICAL AIDS - PART II • Clinical Measurements • Ordering Procedures • Hands-on Experiences	Dr. Randall Jose
12:30- 1:30	Lounge	BUFFET LUNCHEON	
1:30- 2:45	Salon B	CURRENT LOW VISION RESEARCH	
		A. Advances in Eccentric Viewing Evaluation & Training	Gale Watson
		B. Illumination & Color Contrast Research for Increasing Worker Productivity	Dr. Shelly Miles
		C. Advances in Visual Field Enhancement Systems Evaluation & Training	Audrey J. Smith
2:45- 3:00		BREAK	
3:00- 4:15	Salon A, B, C	ENVIRONMENTAL ADAPTATIONS FOR LOW VISION INDIVIDUALS (WORK/TRAVEL/HOME)	Dr. Shelly Miles Audrey J. Smith Gale Watson
4:15- 5:00	Salon B	PSYCHOSOCIAL ASPECTS OF LOW VISION	Janice Knuth
5:00- 5:15	Salon B	"A LOOK BACK & A LOOK AHEAD"	Staff
5:00- 7:00	Salon A	FILM FESTIVAL (Optional)	

PURPOSE

To provide an opportunity for service providers of varied disciplines to share common educational and problem-solving experiences which can enhance services to low vision individuals.

PHILOSOPHY

The designers of this training workshop believe that:

-low vision persons have unique needs which must be addressed in any comprehensive provision of services to this population

-individuals with low vision are best served when the expertise of several disciplines is integrated into a common program of services

-many service delivery related problems are solvable, especially when individuals creatively explore options and alternatives

CREDITS

Continuing Education Units:

All participants interested in receiving continuing education credit for this training event may apply during the last session.

Eye Care Specialists Tract - 10 units

Intermediate & Advanced Rehabilitation Tracts - 14 units

Certification Credits:

Certified Rehabilitation Counselors may receive 14 hours credit towards recertification. The certification number will be

OBJECTIVES

Intermediate Tract:

- To sequentially and systemically explore the field of low vision and its applications to service delivery
- To exchange ideas with speakers and co-participants
- To be familiar with near and distance optical aids
- To develops methods for applying workshop information and strategies

Advanced Tract:

- To update knowledge and skills in serving low vision individuals
- To clarify problems and identify relevant options for enhancing service delivery
- To increase knowledge in new optical and nonoptical technology
- To map out strategies for applying information and ideas gained from the workshop

Eye Care Specialists Tract:

- To update eye care specialists on the latest advances in the field of low vision
- To increase knowledge of interdisciplinary roles and resources enhancing vision care to low vision patients
- To increase understanding of the functional implications of low vision services

WORKSHOP STAFF

Low Vision Research & Training Center

- Anthony DiStefano, O.D., M.Ed., M.P.H.
  Director
- Audrey J. Smith, M.Ed.
  Director of Training
- Gale Watson, M.A.Ed.
  Education Specialist
- Laura A. Edwards, M.S.
  Program Coordinator

William Feinbloom Vision Rehabilitation Center

- Richard Brilliant, O.D.
  Chief
- Sarah Appel, O.D.
  Staff Optometrist
- Ann Barber, M.Ed.
  Mobility Specialist
- Mark Steciw, M.Ed.
  Education Specialist
- Marcy Graboyes, M.S.W.
  Low Vision Social Worker

Regional Office for the Rehabilitation Services Administration:

- William H. Morgan
  Regional Representative

Pennsylvania Blindness and Visual Services

- Joseph A. Snyder
  Commissioner
- Donald L. Sundell
  Director of Training

WORKSHOP STAFF

Nevil Institute for Rehabilitation and Service

- Janice Knuth, A.C.S.W.
  Associate Director

New Jersey Commission for the Blind

- Norma Krajczar, M.A.
  Executive Director

Delaware Division of the Visually Impaired

- J. Lynn Young, M.S.Ed.
  Director of Educational Services

Elwyn Institutes

- Paul Cote, M.Ed.
  Director of the Low Vision Clinic
- Karen Shane-Cote, M.Ed.
  Mobility Specialist

Special Guests

- Randall Jose, O.D.
  Director, Low Vision Unit
  (University of Houston)
- Shelly Miles, Ph.D.
  Assistant Professor, Psychology
  Research Associate
  Blindness & Low Vision R&T Center
  Mississippi State University
- Charles S. Hollander, O.D.
  Sight Improvement Center, Inc.
- Richard L. Welsh, Ph.D.
  Superintendent
  The MD School for the Blind
- Deborah Budick, O.D.
  National Consultant
  Low Vision Services
  American Foundation for the Blind

EXHIBITORS

We would like to express our sincere appreciation to the following companies who have contributed toward the Wednesday evening reception:

-Apollo Visual Tech.

-Benson Optical Company

-Designs for Vision

-Luzerne Optical

-Science for the Blind

Other vendors exhibiting or contributing publications include:

Reader's Digest

Bernell Corporation

Zeiss Company

Smith-Kettlewell

Big Eyeland

National Association for the Blind

Council of Citizens with Low Vision

Recreation Innovations

American Optical Company

Vision Incorporated

Independent Living Aids

Keeler Instruments

Walters Company

Sight Improvement Center, Inc.

American Foundation for the Blind

APPRECIATION

For the special assistance received in planning for the workshop as well as assuring everything ran smoothly, a special thanks to:

Patricia Valecce
Barbara Prihar
Nancy Uhrich

Sheree Aston, O.D.
Rebecca Hutchins

PARTICIPANTS: AN OVERVIEW

Public Agencies Represented:

(PA) Blindness and Visual Services

(MD) Division of Vocational Rehabilitation

(VA) Department of Visually Impaired

(DE) Division of Visually Impaired

(DE) Division of Vocational Rehabilitation

(DC) Vocational Rehabilitation Service Administration

(NJ) Commission for the Blind

(WV) Division of Vocation Rehabilitation

Eye Care Specialists

Pennsylvania

New Jersey

Other

REGIONAL LOW VISION TRAINING WORKSHOP
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PARTICIPANTS IN TRAINING ACTIVITIES

TRAINING TYPE	RC	RT	O&M	ECS	SEd	C/P	O	Total
Regional Low Vision workshop (1)	35	25	20	25	-	-	15	*125
State & local inservices (17)	96	68	63	8	42	24	165	466
Curriculum Coursework (4)			22		58			80
Assn. Meetings & Conferences Presentations (21)	45	35	69	175	158	354	394	1225
TOTALS	176	128	174	208	258	378	569	1896

Code:

RC = Rehabilitation Counselor
RT = Rehabilitation Teacher
O&M = Orientation & Mobility Specialist
ECS = Eye Care Specialist
SEd = Special Educators
C/P = Consumers and/or Parents of
O = Other

* This figure includes speakers and exhibitors who participated after their presentations were completed. Note: Some professionals were also consumers.

Note: The distributions are approximations.

1200 West Godfrey Avenue
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**Pennsylvania College
of Optometry**

LOW VISION RESEARCH
and TRAINING CENTER

November 19, 1982

Dear Participant:

We certainly did enjoy meeting each of you and/or renewing acquaintances at the recent Regional Low Vision Training Workshop. The workshop according to participant reactions, was successful in meeting its objectives.

Now that you are back in your work setting, the memories of the time spent together at the low vision workshop may have begun fading. You may be thinking there is just too much to do to try something new. Or you may have been inspired sufficiently to actually rearrange your work schedule to permit application of other ways of serving your clients or patients.

There were so many excellent action plans developed by participants at the workshop that we are anxious to help you see these come to fruition. One way we thought we might help is to send to you (1) a summary of reactions to the workshop, (2) a summary of action plans developed by rehabilitation professionals who participated, and (3) a list of participants names and addresses for use in further correspondence. Another attachment (4) provides bibliographic data on one of the topics, eccentric viewing, which was highlighted at the workshop.

A subsequent mailing will provide highlights of the Masters of Science Degree Program in Low Vision.

If you will share the progress you make in fulfilling your action (plan)s either individually or as a group, we will regionally disseminate highlights of these innovations in low vision.

Thank you for your continued interest in furthering advances in low vision.

Sincerely,

Audrey J Smith
Audrey J. Smith
Director of Training

Laura A. Edwards
Laura A. Edwards
Program Coordinator

Encl:4

"*Enhancing the quality of life of low vision individuals.*"

REGIONAL LOW VISION TRAINING WORKSHOP
SUMMARY OF PARTICIPANT REACTIONS

On November 3-5, 1982, at the Stadium Hilton in Philadelphia, PA, over 100 participants met to learn more about low vision and ways to serve the low vision population more effectively. The program was divided into three tracts: intermediate, advanced and eye care specialists. Each tract was approached uniquely. The intermediate tract was designed to sequentially present essential information for understanding how to work with the low vision population. The advanced tract built on experiences of participants and the need to consider options for solving varied problems resulting from working with this population. The eye care specialists received a more technical and specialized approach.

OVERALL

Overall participants from all three tracts rated the program 4.4 out of a possible 5 (when 5 is high and 1 is low). This rating was distributed as follows among the areas being rated as well as among the tracts.

	Intermediate	Advanced	ECS	Average
1. Need for low vision Workshop	4.58	4.56	4.75	4.63
2. Relevance of Content	4.25	4.06	3.94	4.08
3. Methods of Presentation	4.46	4.26	4.12	4.28
4. Instructors knowledgeable and Prepared	4.80	4.49	4.75	4.68
5. Audio-visual aids	4.08	3.83	4.37	4.09
6. Meeting facilities	4.17	4.35	4.69	4.40
7. Participant's opportunities to contribute	4.58	4.47	4.31	4.45
8. Application to worksetting	4.55	4.26	4.44	4.41

AREAS OF LEARNING

Participants' summarized responses to the most important thing learned, included, but is not limited to,-

- The importance of the interdisciplinary approach
- Aids and their uses with low vision clients

- The need for individualized approaches to service delivery
- Psychosocial factors
- Training with optical aids
- Advances in low vision care and services
- Total visual rehabilitation process
- Learning patient/client's needs and goals
- Eccentric viewing
- Field expanders
- Resources for rural low vision services
- Adapting environments
- "I am not alone"
- New vendor locally for aids
- Application of information presented to problems in the field

RECOMMENDATIONS FOR IMPROVEMENTS

Among the recommendations given for improving similar workshops, participants agreed most on the following-

- Provide more hands-on-experiences with aids
- Intermingle disciplines more, separate by disciplines, and/or separate by levels within disciplines
- Increase demonstrations, case studies, role plays, simulations
- Involve more consumers
- Increase group problem-solving sessions
- Provide more models for low vision programs
- Keep to scheduled time, shorten the day and extend number of days
- Include visits to low vision centers and information on setting up of same
- Add more on mobility with aids
- Discuss certification issues and strategies

- Add more on rural services
- Add more information on multi-handicapped children, representation from private industry, and other specialized needs

FOLLOW-UP TRAINING AREAS:

Suggestions were offered also for future training topics which would build on this workshop. These in summary encompassed-

- Communication models between educators and rehabilitation agencies, and between optometrists and ophthalmologists (team-building techniques)
- Low vision optical exams (with clients) (preferably in a low vision clinic setting)
- Multi-handicapped kids and/or elderly low vision services
- Follow-up in the home/workplace/school
- Peer support groups
- Localized training
- Eccentric viewing training techniques
- Low vision aids for the workplace
- Functional visual assessments in the home
- Deaf-blind
- Expanded problem-solving and sharing in small groups
- Mobility evaluations and training with aids
- Vendors sharing products
- Management of low vision patients (ECS tract)
- More on psychosocial aspects
- Advances
- Pre-optical exam assessments

ADDITIONAL COMMENTS:

Typical comments summarizing the entire experience were

"The workshop was very good and I think I will be able use much of this information when I work with low vision individuals."

"This was an enjoyable meeting and an important step as the area of low vision is expanding."

"Very professionally organized and efficiently run program."

"Thanks for the opportunity to participate! I learned a lot, and am coming away with many new ideas and questions. The speakers were very clear in their presentations-good choices."

"An excellent workshop. One of the best I've attended, both in terms of content, skill of speakers and comfort for participants."

REGIONAL LOW VISION TRAINING WORKSHOP

SUMMARY OF ACTION PLANS

As part of the training conducted November 3-5, 1982, participants were encouraged to develop action plans. Rehabilitation professionals addressed memos to their supervisors outlining how they might apply what they had learned during the workshop. A copy of the memo was given to the Low Vision Research & Training Center for use in the future. The types of activities planned for follow-up include-

- Teach other staff about the advances in low vision presented at the conference and discuss areas for improving services (use a pretest to determine staff knowledge levels and plan from there) (use role plays)
- Consider incorporating relevant information into existing Vocational Rehabilitation Counselor handbook
- Encourage other staff to attend similar workshops
- Provide clients orientation to low vision evaluation and the possible usefulness of aids for travel
- Establish a loan library or low vision aid bank for clients to try out
- Invite selected low vision experts in to help our staff learn more about low vision especially psychosocial aspects
- Get specialized follow-up training for ourselves
- Consider solving rural low vision service delivery problems by training one specialist in low vision per office, involving PCO students with low vision expertise under practicum conditions, or explore other states' approaches described at the conference
- Initiate efforts to begin a low vision center and/or re-establish a low vision clinic which uses the more advanced and sophisticatd aids
- Orient the medical community beginning with ophthalmalogy residents to low vision
- Increase the number of clients referred low vision exams
- Establish greater liaison between client and low vision personnel
- Visit WFVRC to observe what is available to our clients in Delaware through the clinic

- Build on the professional contacts established at the workshop for future problem solving

- Exercise greater understanding with low vision clients in terms of their needs and ways to meet these

ADVANCED LOW VISION SEMINAR - TECHNOLOGY TRAINING RESEARCH

August 18, 1982

Brandywine Country Club
9:00-3:30

OVERALL OBJECTIVE

To update educators, rehabilitation professionals, and eye care specialists in low vision technology, research activities, and training protocols for enhancing service delivery to low vision persons.

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AGENDA

9:00-9:10	Welcome & Introductions	Lynn Young Workshop Facilitator
9:10-9:50	*Low Vision Research & Training Center*	Laura Edwards Audrey J. Smith Gale Watson
9:50-10:45	*Advances in Optical Aids Technology*	Rich Brilliant
10:45-11:00	Break	
11:00-11:30	*Current Eccentric Viewing Training Techniques*	Gale Watson
11:30-12:00	*Current Training Techniques with Visual Field Enhancement Systems*	Audrey J. Smith
12:00-1:30	Lunch	
1:30-2:00	*DVI & Low Vision Referrals, Communication and Coordination*	Jim Burcham Lynn Young
2:00-3:00	*Optical Aids Learning Centers*	Gale Watson Audrey J. Smith Rich Brilliant Lynn Young
3:00-3:30	Wrap-Up: Questions & Answers	Seminar Staff
3:30-	Debriefing & Cash Bar	

PARTICIPANT LIST FOR THE
ADVANCED LOW VISION SEMINAR, FOR THE
DELAWARE DIVISION OF THE VISUALLY IMPAIRED

Presenter/s: Richard Brilliant, O.D.
Audrey J. Smith, M.Ed.
Gale Watson, M.Ed.
Laura Edwards, M.S.
Lynn Young, M.Ed
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Date: August 18, 1982

Location: Wilmington, DE

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LOW VISION PRESENTATIONS IN 1982

TITLE OF PRESENTATION: "Vision Awareness"

ORGANIZATION: Office of Mental Retardation & Blindness & Visual Services

DATE: January 27, 1982

LOCATION: Whitehaven, PA

SPEAKERS: Karen Shane-Cote, M.Ed.
Mark Cohen

PARTICIPANTS: Male 10 Females 25 Total 35
(Minorities 0)

INSTRUCTIONAL OBJECTIVES: To increase awareness of low vision.

TITLE OF PRESENTATION: "Simulation of Visual Impairments"

ORGANIZATION: National Association of Parents of the Visually Impaired - Philadelphia Chapter

DATE: February 8, 1982

LOCATION: Philadelphia, PA

SPEAKERS: Robert Ruggiero, O.D.
Marsha Levy, B.M.Ed., B.M.Ed.
Marcy Graboyes, M.S.W.

PARTICIPANTS: Male 8 Female 16 Total 24
(Minorities 8)

INSTRUCTIONAL OBJECTIVES: To increase understanding of low vision conditions and the use of optometric & nonoptometric aids for increasing vision usage.

TITLE OF PRESENTATION: "Low Vision Programs for Visually Impaired Children"

ORGANIZATION: National Association for

Parents of Visually Impaired

DATE: February 25, 1982

LOCATION: Los Angeles, CA

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 15 Female 65 Total 80
(Minorities 20)

INSTRUCTIONAL OBJECTIVES: To familiarize parents of visually impaired children with principles of visually development, functional evaluation, and training methods for enhancing vision.

To familiarize with resources for same.

TITLE OF PRESENTATION: "Low Vision"

ORGANIZATION: Nevil Institute Center for Independent Living, Low Vision Support Group

DATE: February 26, 1982

LOCATION: Philadelphia, PA

SPEAKERS: Sarah Appel, O.D.
Marcy Graboyes, M.S.W.
Marsha Levy, B.M.Ed.

PARTICIPANTS: Male 7 Female 8 Total 15
(Miniorities 7)

INSTRUCTIONAL OBJECTIVES: To discuss low vision problems and to answer questions consumers might have regarding low vision services and aids.

TITLE OF PRESENTATION: "Advances in Low Vision Care for Persons with Retinitis Pigmentosa"

ORGANIZATION: Retinitis Pigmentosa Foundation

DATE: March 1, 1982

LOCATION: Philadelphia, PA

SPEAKER: Robert Ruggiero, O.D.

PARTICIPANTS: Male 9 Female 6 Total 15 (Minorities 5)

INSTRUCTIONAL OBJECTIVES: To increase understanding of the state of the art in low vision care for Retinitis Pigmentosa patients.

TITLE OF PRESENTATION: "Low Vision Research & Training Center"

ORGANIZATION: Graduates in Special Education and Orientation & Mobility

DATE: March 9, 1982

LOCATION: Philadelphia, PA

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 1 Female 8 Total 8 (Minorities 1)

INSTRUCTIONAL OBJECTIVES: To familiarize with Low Vision Research & Training Center projects and activities and its availability as a resource.

To increase awareness of fresnel prism research in enhancing mobility for low vision individuals.

TITLE OF PRESENTATION: "The Low Vision Evaluation"

ORGANIZATION: PA Division of the Visually Handicapped & AAWB

DATE: March 12, 1982

LOCATION: Harrisburg, PA

SPEAKERS: Robert Ruggiero, O.D.
Ann Barber, M.Ed.

PARTICIPANTS: Male 15 Female 15 Total 30 (Minorities 5)

INSTRUCTIONAL OBJECTIVES: To increase understanding of the low vision evaluation process.

TITLE OF PRESENTATION: "Low Vision and Low Vision Aids, an Educators Approach"

ORGANIZATION: Temple University - Special Education 565 - Educational Implications of Visual Dysfunctions

DATE: March 17, 1982

LOCATION: Philadelphia, PA

SPEAKER: Gale Watson, M.A.Ed.

PARTICIPANTS: Male 6 Female 9 Total 15 (Minorities 1)

INSTRUCTIONAL OBJECTIVES: To sensitize special educators to the specialized needs of low vision students.

To enable special educators to identify low vision aids and their respective advantages and disadvantages.

To aid special educators in identification of problems low vision children face in the use of vision and low vision aids.

To assist special educators in the development of intervention strategies for enabling low vision students in overcoming problems in the use of vision and low vision aids.

To give special educators access to resources for accessing low vision services for their students.

TITLE OF PRESENTATION: "Anatomy and Diseases of the Eye"

ORGANIZATION: First Step

DATE: March 31, 1982

LOCATION: Chester County, PA

SPEAKERS: Audrey J. Smith, M.Ed.
Sheree Aston, O.D.

PARTICIPANTS: Male 2 Female 8 Total 10
(Minorities 4)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of basic eye diseases in multi-impaired adults.

To increase understanding of functional implications of eye reports.

TITLE OF PRESENTATION: "Vision Stimulation for Multiply Impaired Children"

ORGANIZATION: National Association for Parents of Visually Impaired Children

DATE: April 3, 1982

LOCATION: Dallas, TX

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 32 Female 58 Total 90
(Minorities 16)

INSTRUCTIONAL OBJECTIVES: To familiarize parents and teachers of basic concepts of vision development, functional vision evaluation, and training techniques for stimulating vision in multiply impaired low vision children.

To increase knowledge concerning resources available with locally and nationally.

TITLE OF PRESENTATION: "Vision Awareness"

ORGANIZATION: Office of Mental Retardation & Blindness & Visual Services

DATE: April 27 & 28, 1982

LOCATION: Sellings Grove, PA

SPEAKERS: Mark Steciw, M.Ed.
Karen Shane-Cote, M.Ed.

PARTICIPANTS: Male 12 Female 28 Total 40
(Minorities 2)

INSTRUCTIONAL OBJECTIVES: To increase awareness of low vision.

TITLE OF PRESENTATION: "Effects of Recent and Proposed Legislation on Education and Rehabilitation of Visually Impaired"

ORGANIZATION: National Braille Association and VISER Group

DATE: April 30, 1982

LOCATION: Denver, CO

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 30 Female 170 Total 200
(Minorities 16)

INSTRUCTIONAL OBJECTIVES: To increase awareness of specific changes proposed and their implications for educational and rehabilitation programs.

To provide information for contacting legislative representatives.

TITLE OF PRESENTATION: "Low Vision Assessment"

ORGANIZATION: National Braille Association and VISER Group

DATE: April 30, 1982

LOCATION: Denver, CO

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 3 Female 19 Total 22
(Minorities 3)

INSTRUCTIONAL OBJECTIVES: To provide resources and techniques for assessing functional vision of low vision persons in variety of educational settings.

TITLE OF PRESENTATION: "Functional Environment Cues for Low Vision Individuals"

ORGANIZATION: National Braille Association

DATE: April 30, 1982

LOCATION: Denver, CO

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 7 Female 31 Total 38 (Minorities 5)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of functional environmental cues for home, work and travel.

To provide methods for teaching clients how to use cues to enhance visual performance.

TITLE OF PRESENTATION: "Research At The Eastern Blind Rehabilitation Center"

ORGANIZATION: Veterans Administration Rehabilitative Engineering Research & Development

DATE: May 6 & 7, 1982

LOCATION: Palo Alto, CA

SPEAKER: William De l'Aune, Ph.D.

PARTICIPANTS: Male 24 Female 6 Total 30 (Minorities 4)

INSTRUCTIONAL OBJECTIVES: To increase awareness of internal research activities and cooperative sharing of data base information.

TITLE OF PRESENTATION: "Low Vision Workshop"

ORGANIZATION: Blindness & Visual Services

DATE: May 13 & 14, 1982

LOCATION: Philadelphia, PA

SPEAKERS:
Sarah Appel, O.D.
Karen Shane-Cote, M.Ed.
Gale Watson, M.A.Ed.

PARTICIPANTS: Male 8 Female 17 Total 25
(Minorities 1)

INSTRUCTIONAL OBJECTIVES:

To increase knowledge of low vision services.

To increase knowledge of low vision individuals.

To increase understanding of low vision aids and their uses.

TITLE OF PRESENTATION: "Vision Stimulation for Multiply Impaired Children"

ORGANIZATION: National Association of Parents of Visually Impaired

DATE: May 14 & 15, 1982

LOCATION: Phoenix, AZ

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 14 Female 32 Total 46
(Minorities 12)

INSTRUCTIONAL OBJECTIVES:

To familiarize parents and teachers of basic concepts of vision development, functional vision evaluation, and training techniques for stimulating vision in multiply impaired low vision children.

To increase knowledge concerning resources available with locally and nationally.

TITLE OF PRESENTATION: "Low Vision Research & Training Center: An Overview"

ORGANIZATION: NIHR, RSA, OSE Staff

DATE: May 19, 1982 (10:00-11:30 AM)

LOCATION: DC Switzer Building, 3rd floor Conference Room

SPEAKERS: Audrey J. Smith, M.Ed.
Laura A. Edwards, M.S.

PARTICIPANTS: Male 9 Female 7 Total 16 (Minorities 5)

INSTRUCTIONAL OBJECTIVES: To create awareness of low vision and its effects. To increase understanding of the value of the research and training activities planned for 1982.

TITLE OF PRESENTATION: "Low Vision Research & Training Center: An Overview"

ORGANIZATION: Low Vision Interagency Committee

DATE: May 19, 1982 (1:30-3:00 PM)

LOCATION: Washington, DC

SPEAKERS: Audrey J. Smith, M.Ed.
Laura A. Edwards, M.S.

PARTICIPANTS: Male 7 Female 5 Total 12 (Minorities 4)

INSTRUCTIONAL OBJECTIVES: To increase understanding of the research projects and training planned this year for the enhancement of services to low vision individuals.

TITLE OF PRESENTATION: "NIHR Low Vision Research & Training Center"

ORGANIZATION: Jewish Guild for the Blind

DATE: May 21, 1982

LOCATION: New York, NY

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 23 Female 27 Total 50 (Minorities 6)

INSTRUCTIONAL OBJECTIVES: To familiarize with research projects.

To identify applicability to their rehabilitation work.

To provide resource information and establish cooperative efforts.

TITLE OF PRESENTATION: "Vision Awarenes: Low Vision"

ORGANIZATION: Office of Mental Retardation & Blindness & Visual Services

DATE: June 9, 1982

LOCATION: Pittsburgh, PA

SPEAKERS: Sarah Appel, O.D.
Karen Shane-Cote, M.Ed.

PARTICIPANTS: Male 18 Female 22 Total 40 (Minorities 4)

INSTRUCTIONAL OBJECTIVES: To increase awareness of low vision.

TITLE OF PRESENTATION: "Low Vision Workshop"

ORGANIZATION: Blindness & Visual Services

DATE: June 10 & 11, 1982

LOCATION: Pittsburgh, PA

SPEAKERS: Sarah Appel, O.D.
Duane Geruschat, M.A.
Karen Shane-Cote, M.Ed.

PARTICIPANTS: Male 10 Female 24 Total 34 (Minorities 2)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of low vision services.

To increase knowledge of low vision individuals.

	To increase understanding of low vision aids and their uses.
TITLE OF PRESENTATION:	"Low Vision and the Visually Impaired Students"
ORGANIZATION:	Texas Educational Service Center
DATE:	June 10-11, 1982
LOCATION:	Fort Worth, TX
SPEAKERS:	Gale Watson, M.A.Ed. Robert Ruggiero, O.D.
PARTICIPANTS:	Male 0 Female 10 Total 10 (Minorities 0)
INSTRUCTIONAL OBJECTIVES:	To sensitize special educators to the specialized needs of low vision students. To enable special educators to identify low vision aids and their respective advantages and disadvantages. To aid special educators in identification of problems low vision children face in the use of vision and low vision aids. To assist special educators in the development of intervention strategies for enabling low vision students in overcoming problems in the use of vision and low vision aids. To give special educators access to resources for accessing low vision services for their students. To familiarize special educators with low vision evaluation procedures and diseases of the eye.
TITLE OF PRESENTATION:	"Infant Vision Stimulation"

ORGANIZATION: Overbrook School for the Blind

DATE: June 21, 1982

LOCATION: Philadelphia, PA

SPEAKERS: Audrey J. Smith, M.Ed.
Sheree Aston, O.D.
Karen Shane-Cote, M.Ed.

PARTICIPANTS: Male 0 Female 11 Total 11 (Minorities 3)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of basic principles of vision development and stimulation of infants with low vision.

TITLE OF PRESENTATION: "Clinical Vision/Functional Vision do they Relate"

ORGANIZATION: AAWB - Low Vision Section

DATE: July, 1982

LOCATION: Orlando, FL

SPEAKERS: Gale Watson, M.A.Ed.

PARTICIPANT: Male 15 Female 15 Total 30 (Minorities 3 est.)

INSTRUCTIONAL OBJECTIVES: To report on compilation of low vision research (on correlation coefficients and variables) in low vision examinations and training.

TITLE OF PRESENTATION: "Low Vision Workshop"

ORGANIZATION: Blindness & Visual Services

DATE: July 15 & 16, 1982

LOCATION: Erie, PA

SPEAKERS: Robert Ruggiero, O.D.
Karen Shane-Cote, M.Ed.

PARTICIPANTS: Male 15 Female 17 Total 32 (Minorities 0)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of low vision services.

To increase knowledge of low vision individuals.

To increase understanding of low vision aids and their uses.

TITLE OF PRESENTATION: "The Use of Telescopes in Educational Settings"

ORGANIZATION: AAWB

DATE: July 21, 1982

LOCATION: Orlando, FL

SPEAKER: Duane Geruschat, M.A.

PARTICIPANTS: Male 18 Female 17 Total 35 (Minorities uncertain)

INSTRUCTIONAL OBJECTIVES: To review and update participants on the latest techniques for educating students in the use of telescopes.

TITLE OF PRESENTATION: "Computerized Information Systems"

ORGANIZATION: AAWB National Conference

DATE: July 26, 1982

LOCATION: Orlando, FL

SPEAKERS: Anthony DiStefano, O.D., M.Ed.,, M.P.H.
William De l'Aune, Ph.D.

PARTICIPANTS: Male 10 Female 40 Total 50 (Minorities 5)

INSTRUCTIONAL OBJECTIVES: To raise level of awareness regarding need for standardized data in low vision which can enhance low vision service delivery.

To stimulate possible participation from other agencies in the future low vision network.

TITLE OF PRESENTATION: "Educational Implications of Low Vision"

ORGANIZATION: Geneseo State College

DATE: August 2-6, 1982

LOCATION: Geneseo, NY

SPEAKER: Duane Geruschat, M.A.

PARTICIPANTS: Male 4 Female 6 Total 10 (Minorities 0)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of anatomy and physiology of the eye.

To increase knowledge of functional vision assessments.

To gain understanding of low vision examination procedures.

To increase awareness of optical and non-optical aids.

To identify resources and uses for available instructional materials.

TITLE OF PRESENTATION: "Low Vision Workshop"

ORGANIZATION: Blindness & Visual Services

DATE: August 12-13, 1982

LOCATION: Harrisburg, PA

SPEAKERS: Robert Ruggiero, O.D.
Karen Shane-Cote, M.Ed.

PARTICIPANTS: Male 12 Female 13 Total 25 (Minorities 0)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of low vision services.

To increase knowledge of low vision individuals.

To increase understanding of low vision aids and their uses.

TITLE OF PRESENTATION: "Advanced Low Vision Seminar"

ORGANIZATION: Division for the Visually Impaired Education Department-Delaware

DATE: August 18, 1982

LOCATION: Wilmington, DE

SPEAKERS:
Lynne Young, M.S.Ed.
James Burcham, B.S., M.Ed.
Laura A. Edwards, M.S.

PARTICIPANTS: Male 13 Female 8 Total 21 (Minorities 0)

INSTRUCTIONAL OBJECTIVES: To update educators, rehabilitation professionals, and eye care specialists in low vision technology, research activities, and training protocols for enhancing service delivery to low vision persons.

TITLE OF PRESENTATION: "Low Vision Workshop"

ORGANIZATION: Blindness & Visual Services

DATE: September 16 & 17, 1982

LOCATION: Altoona, PA

SPEAKERS:
Richard Brilliant, O.D.
Karen Shane-Cote, M.Ed.

PARTICIPANTS: Male 10 Female 19 Total 29 (Minorities 3)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of low vision services.

To increase knowledge of low vision individuals.

To increase understanding of low vision aids and their uses.

TITLE OF PRESENTATION: "Low Vision Training"

ORGANIZATION: Blindness & Visual Services

DATE: October 15 & 16, 1982

LOCATION: Wilkes-Barre, PA

SPEAKERS: Richard Brilliant, O.D.
Karen Shane-Cote, M.Ed.
Marcy Graboyes, M.S.W.

PARTICIPANTS: Male 15 Female 18 Total 33
(Minorities 2)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of low vision services.

To increase knowledge of low vision individuals.

To increase understanding of low vision aids and their uses.

TITLE OF PRESENTATION: "Optical Aids for Visual Enhancement of the Albino Patient"

ORGANIZATION: Albinism Workshop for Nevil Institute in Rehabilitation Service & Community

DATE: October 16, 1982

LOCATION: PCO, Philadelphia, PA

SPEAKER: Robert Ruggiero, O.D.

PARTICIPANTS: Male 25 Female 35 Total 60
(Minorities 20)

INSTRUCTIONAL OBJECTIVES: To increase awareness of resources available to enhance visual functioning of albino patients.

TITLE OF PRESENTATION: "Eye Care Services Prevention Maintenance and Sustenance"

ORGANIZATION: Delaware County Association for the Blind

DATE: October 22, 1982

LOCATION: Philadelphia, PA

SPEAKERS: Richard Brilliant, O.D.
Satya B. Verma, O.D.

PARTICIPANTS: Male 40 Female 60 Total 100 (Minorities 5)

INSTRUCTIONAL OBJECTIVES: To increase knowledge of visual needs and how to maintain or use residual vision.

To increase understanding of the importance of using appropriate illumination in conjuntion with optical devices for low vision.

To increase knowledge of basic types of low vision services.

TITLE OF PRESENTATION: "Low Vision Training Workshop"

ORGANIZATION: Region 18, Educational Service Center

DATE: October 25 & 26, 1982

LOCATION: Midland, TX

SPEAKER:

PARTICIPANTS: Male 4 Female 26 Total 30 (Minorities 7)

INSTRUCTIONAL OBJECTIVES: To increase knowledge in vision stimulation techniques of low vision children include multiply handicapped.

To familiarize with basic optical principles and training techniques for using optical aids in the classroom setting.

TITLE OF PRESENTATION: "Microcomputer Applications for Psychology"

ORGANIZATION: New England Psychological Association

DATE: October 30, 1982

LOCATION: Worcester, MA

SPEAKER: William De l'Aune, Ph.D.

PARTICIPANTS: Male 100 Female 100 Total 200 (Minorities 20)

INSTRUCTIONAL OBJECTIVES: To increase awareness of successful and potential applications of microcomputers in service delivery systems such as related to psychology.

TITLE OF PRESENTATION: "Low Vision Training"

ORGANIZATION: Graduate Department in Special Education and Rehabilitation, University of Pittsburgh

DATE: November 15, 1982

LOCATION: Pittsburgh, PA

SPEAKER: Audrey J. Smith, M.Ed.

PARTICIPANTS: Male 4 Female 12 Total 16 (Minorities 2)

INSTRUCTIONAL OBJECTIVES: To increase awareness of NIHR Low Vision Research & Training Center project with emphasis on fresnel prism and mobility.

To increase knowledge of functional environmental cues.

To provide methods for training clients in using these cues to enhance visual functioning.

To familiarize with basic optics and training techniques in optical aids in school and work setting.

TITLE OF PRESENTATION: "Common Disease of Eye and Functional Implications and Vision Stimulation for Children"

ORGANIZATION: Bucks County, NAPVI

DATE: November 16, 1982

LOCATION: Bucks County, PA

SPEAKERS: Audrey J. Smith, M.Ed.
Sheree Aston, O.D.

PARTICIPANTS: Male 6 Female 8 Total 14
(Minorities 0)

INSTRUCTIONAL OBJECTIVES: To enable parents to interpret functional implications of their child's visual problems.

To familiarize with basic techniques of vision stimulation.

To familiarize with parent-oriented resources.

TITLE OF PRESENTATION: "Low Vision and The Aged"

ORGANIZATION: American Public Health Association (Annual Meeting)

DATE: November 17, 1982

LOCATION: Montreal, Canada

SPEAKER: Anthony DiStefano, O.D., M.Ed., M.P.H. (Panel Participant)

PARTICIPANTS: Male 10 Female 10 Total 20
(Minorities 5)

INSTRUCTIONAL OBJECTIVES: To overview status of low vision services for the aged population.

To heighten teachers sensitivies to these unique needs.

TITLE OF PRESENTATION: "Low Vision and Low Vision Aids, an Educators Approach"

ORGANIZATION: Temple University - Special Education 565 - Educational Implications of Visual Dysfunctions

DATE: December 1, 1982

LOCATION: Philadelphia, PA

SPEAKER: Gale Watson, M.A.Ed.

PARTICIPANTS: Male 5 Female 10 Total 15 (Minorities 3) Other 12

INSTRUCTIONAL OBJECTIVES: To sensitize special educators to the specialized needs of low vision students.

To enable special educators to identify low vision aids and their respective advantages and disadvantages.

To aid special educators in identification of problems low vision children face in the use of vision and low vision aids.

To assist special educators in the development of intervention strategies for enabling low vision students in overcoming problems in the use of vision and low vision aids.

To give special educators access to resources for accessing low vision services for their students.

TITLE OF PRESENTATION: "Changing Attitudes and Self Images: Psychosocial Characteristics of WFVRC Patients"

ORGANIZATION: American Academy of Optometry Annual Conference

DATE: December 12, 1982

LOCATION: Philadelphia, PA

SPEAKER: Anthony DiStefano, O.D., M.Ed., M.P.H.

PARTICIPANTS: Male 52 Female 23 Total 75 (Minorities 2)

INSTRUCTIONAL OBJECTIVES: To demonstrate capabilities of data base system.

To profile psychosocial characteristics of patients.

To inform participants of the interrelationships between certain psychosocial factors and other intake characteristics.

TITLE OF PRESENTATION: "Rod Monochronitism"

ORGANIZATION: American Academy of Optometry

DATE: December 13, 1982

LOCATION: Philadelphia, PA

SPEAKER: Roger Cummings, O.D.

PARTICIPANTS: Male 60 Female 20 Total 80
(Minorities 4%)

INSTRUCTIONAL OBJECTIVES: To inform practitioners of the diagnostic tests and low vision therapy used in rehabilitation of low vision individuals.

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